Operator's Manual

McCORMICK
FARMALL
SUPER A
and
SUPER AV

INTERNATIONAL HARVESTER COMPANY

180 North Michigan Ave. Chicago 1, Illinois, U.S.A.

TO THE OWNER

The purpose of this manual is to assist you in realizing the benefits you anticipated when you purchased this International Harvester product. Literally thousands of people have contributed to the design and production of this product and its delivery to you. They have an interest in its successful performance and have provided this manual to give you the benefit of the experience they have gained through years of field testing and normal usage of this and similar products.

The way you operate and the care you give this product will have much to do with its successful performance. This manual has been carefully prepared and the information arranged and illustrated to make it as easy as possible for you to find the information you wish. It will pay you to read the entire manual carefully before operating and keep it handy for future reference. Your International Harvester Dealer will be glad to answer any further questions you may have on the operation or care of this product.

It is the policy of International Harvester Company to improve its products whenever it is possible and practical to do so. We reserve the right to make changes or add improvements at any time without incurring any obligation to make such changes on products sold previously.

All illustrations and descriptive matter in this publication apply to International Harvester products sold under the International, McCormick, McCormick-International, McCormick-Deering, or McCormick-Deering International trade name.

TECHNICAL PUBLICATIONS AVAILABLE

Your International Harvester Dealer and his factory trained servicemen are best qualified to service your equipment. Up-to-date instructions and adequate special tools are also a part of your Dealer's service facilities.

This Operator's Manual was prepared to instruct you in proper operation and maintenance of your equipment. If you desire additional information you may purchase Service Manuals and/or Parts Catalogs. Additional copies of the Operator's Manual are also available.

Fill out the order blank and forward together with your check or money order in the appropriate amount (U.S. Funds) to:

International Harvester Company

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Westmont, Illinois 60559

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R1

DELIVERY REPORT

(This copy to be retained by owner.)

Delivered to_____ Address_____
Purchaser's Name — Street and No. or R.F.D. and Box No.

_____ _____ 19____
Town — State — Date

1. Acres or hectares in crops_____
2. Tractor being replaced if any:
   Make_____ Age_____ (Years)
   Model_____
3. Number tractors owned, including new purchase_____
4. Check chief source of farm income

Dairy	☐
Livestock	☐
Corn	☐
Wheat	☐
Truck	☐
Cotton	☐
Orchard	☐
Other	☐

☐ Farmall Super A

☐ Farmall Super AV

Tractor Serial No._____ (See Illust. 2A)

Engine Serial No._____ (See Illust. 2B)

PREDELIVERY SERVICE

Prior to delivery of the above tractor the following checks and tests were made and corrective action taken as necessary:

- ☐ Shortage in Shipment
- ☐ Damage in Shipment
- ☐ Attachments and Special Features Checked Against Purchase Order
- ☐ Tire Pressures
- ☐ Engine Oil—Drain and refill with correct viscosity oil
- ☐ Air Cleaner—Empty oil from cup and refill with correct viscosity oil
- ☐ Transmission and Final Drive Oil Levels
- ☐ Steering Housing Oil Level
- ☐ Cooling System Level
- ☐ Hydraulic System Fluid Level*
- ☐ Water Level and Gravity of Battery Checked When Installed
- ☐ Engine Oil Pressure
- ☐ Cranking Motor
- ☐ Generator Charging Rate
- ☐ Lights
- ☐ Gear Shifting
- ☐ Clutch
- ☐ Brakes
- ☐ Engine Operation
- ☐ Road Test for General Operation
- ☐ Clean and Polish

DELIVERY SERVICE

At time of delivery the importance of the Operator's Manual was explained and, with it as a guide, instruction was given as indicated by check marks:

- ☐ Precautions with New Tractor
- ☐ Lubricating Entire Tractor
- ☐ Engine and Chassis Lubricant Specifications
- ☐ Checking Oil Levels
- ☐ Care of Air Cleaner
- ☐ Servicing Oil Filter
- ☐ Starting, Stopping, and General Operation
- ☐ Drawbar Adjustment
- ☐ Safe Hitching Practices
- ☐ Care of Cooling System
- ☐ Use of Radiator Shutter*
- ☐ Care of Hydraulic System*
- ☐ Use of Manifold Heat Control*
- ☐ Care of Fuel System
- ☐ Fuel Specifications
- ☐ Adjustment of Clutch
- ☐ Care of Ignition System
- ☐ Care of Generator
- ☐ Care of Battery
- ☐ Adjustment of Brakes
- ☐ Tires—Inflation, Weighting, Care
- ☐ Cold Weather Operation
- ☐ Storing Tractor
- ☐ Starting Tractor After Storage
- ☐ Caution Regarding High-Speed Operation
- ☐ Tightening Nuts and Bolts
- ☐ Keeping Tractor Clean

**When So Equipped.*

The customer's signature below certifies that the tractor was delivered to him in a satisfactory condition and that he received instruction as to its proper operation and maintenance.

Appointment for after-delivery inspection (10 to 30 days after) was made for_____
Date

Signed_____ Signed_____
Customer — Dealer

By_____ By_____

A Careful Operator

IS THE BEST INSURANCE

AGAINST AN ACCIDENT

—*National Safety Council.*

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INTRODUCTION

Assembled in this book are operating and maintenance instructions for the Farmall Super A and Super AV. This material has been prepared in detail in the hope that it will help you to better understand the correct care and efficient operation of your tractor.

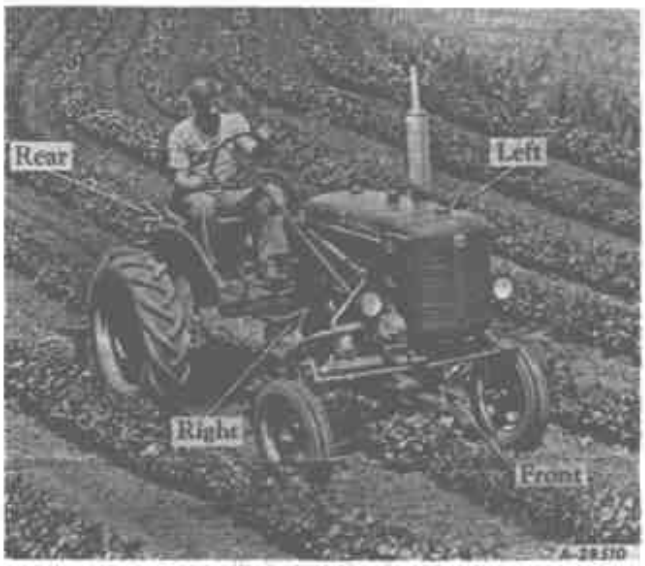
If you should need information not given in this manual, or require the services of a trained mechanic, get in touch with the International Harvester dealer in your locality. Dealers are kept informed on the latest methods of servicing tractors. They carry stocks of IH parts, and are backed in every case by the full facilities of a nearby International Harvester District Office.

Throughout this manual the use of the terms LEFT, RIGHT, FRONT, and REAR must be understood to avoid confusion when following instructions. LEFT and RIGHT indicate the left and right sides of the tractor when facing forward in the driver's seat. Reference to FRONT indicates the radiator end of the tractor, and REAR the drawbar. *See Illust. 2.*

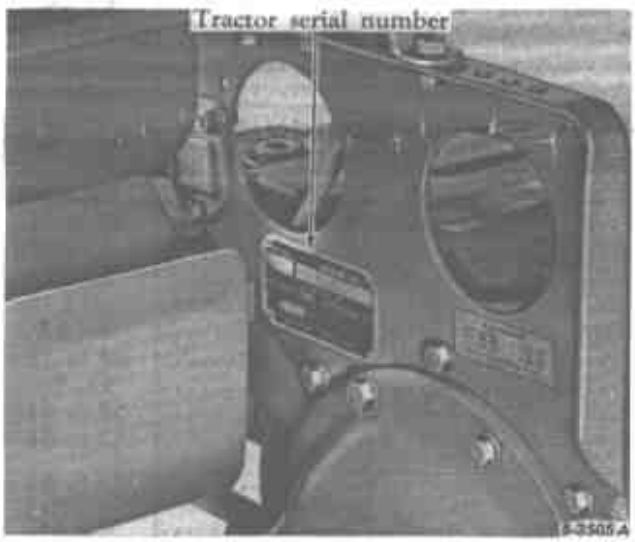
The illustrations in this manual are numbered to correspond with the pages on which they appear; for example, *Illusts. 6, 6A and 6B are on page 6.*

When in need of parts, always specify the tractor and engine serial numbers. The tractor serial number is stamped on a name plate attached to the inside of the left bracket supporting the seat. *See Illust. 2A.* The serial number is preceded by the letters FAA for the Farmall Super A and FAAV for the Super AV. The engine serial number is stamped on the right side of the engine crankcase above the battery ignition unit. *See Illust. 2B.* This serial number is preceded by the letters FAAM for the Super A and FAAVM for the Super AV.

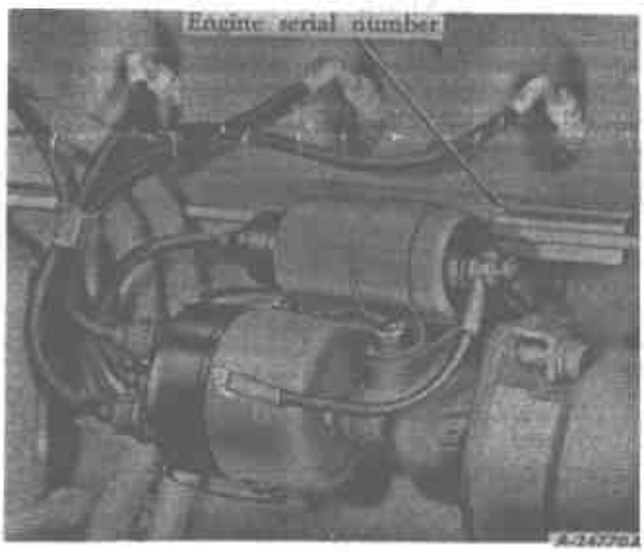
For ready reference we suggest that you write these serial numbers in the spaces provided on the Delivery Report.



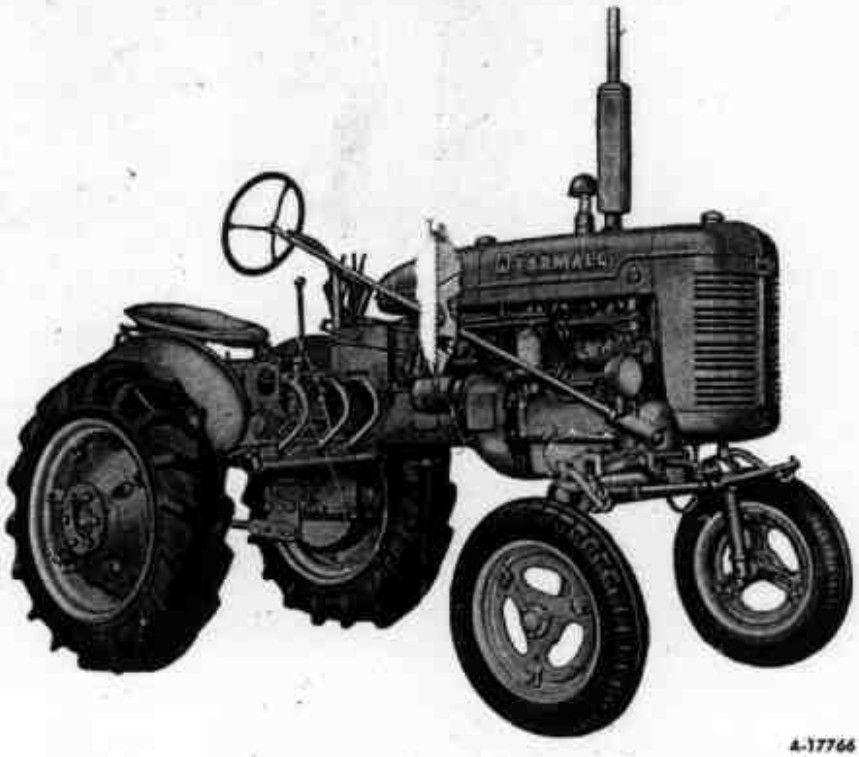
Illust. 2



Illust. 2A
Location of tractor serial number.



Illust. 2B
Location of engine serial number.

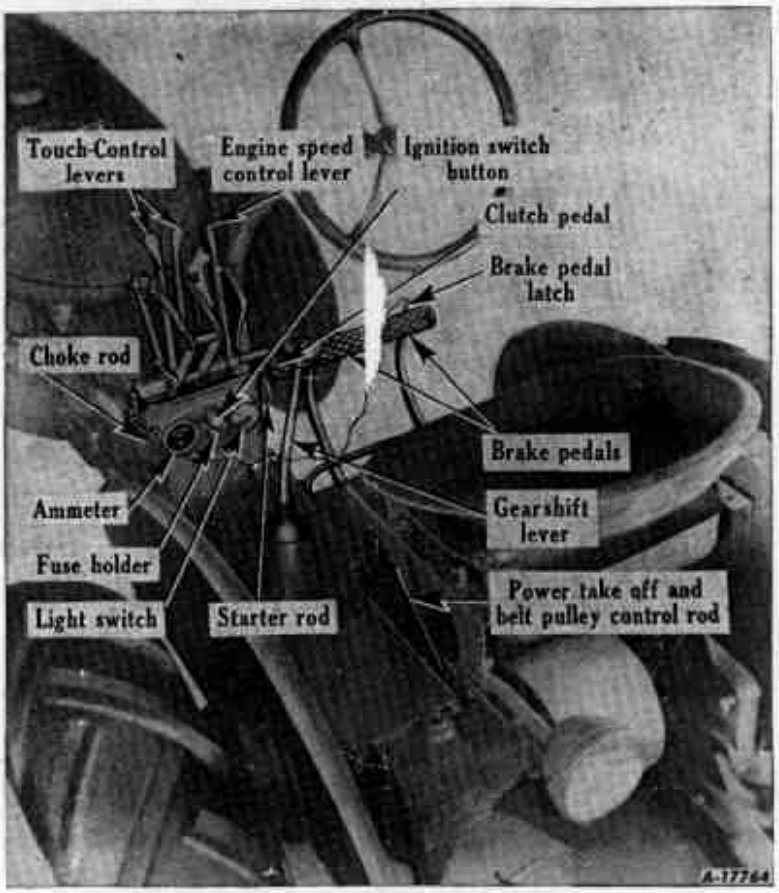


A-17766

Ilust. 3—Right Front View of the Farmall Super-A.

A-17767

Illust. 3A—Left Front View of the Farmall Super-AV.



Illust. 4—Location of Controls.

Instruments and Controls

There is a variety of special equipment available for use with the Farmall Super-A and Super-AV. The instructions for operating and maintaining the special equipment have been included in the instructions for operating and maintaining the tractor. Disregard the instructions for special equipment that is not on your tractor.

Brake Pedals

These pedals are used to stop the tractor, to hold the tractor in a stationary position, or to assist in making sharp turns as outlined below:

To stop the tractor, depress both pedals at the same time. Before driving the tractor in high gear always latch the pedals together.

To hold the tractor in a stationary position, latch the pedals together, depress and lock them in this depressed position by using the brake pedal lock.

To assist in making a sharp turn, the pedals must be operated individually, depressing the pedal on the side toward which the turn is to be made.

The brake pedal latch, *Illusts. 4 and 17,* is used to latch both brake pedals together, causing the brakes to operate simultaneously.

The brake pedal lock, *Illust. 17,* is used to lock the brake pedals in the depressed position which prevents the tractor from moving.

Clutch Pedal

This pedal, when depressed all the way, disengages the engine from the transmission.

Choke Rod

The choke rod makes it possible to regulate the carburetor choke from the driver's seat. Pulling out on the choke rod closes the carburetor choke for starting the engine; pushing it back in opens the choke.

Carburetor Choke Lever

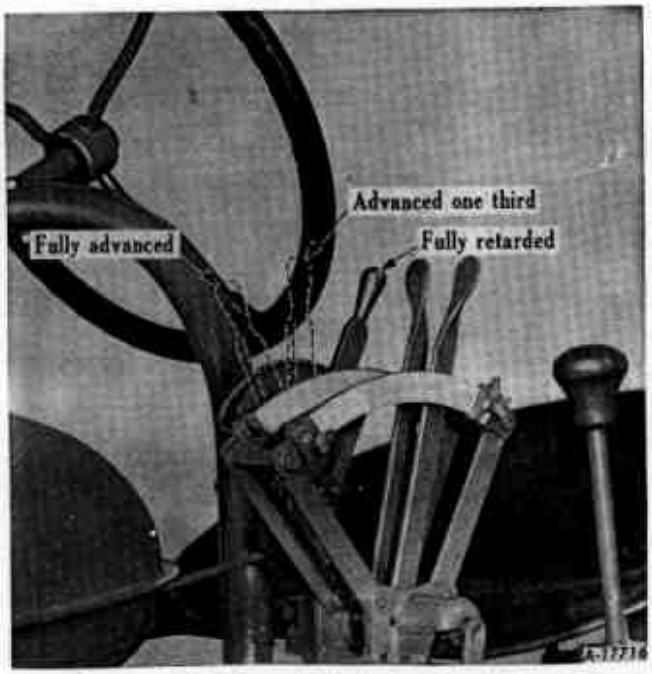
The carburetor choke lever controls the air supply to the carburetor. When the choke lever, *Illusts. 9 and 11A,* is moved down all the way (closed position) the air supply is cut off, thereby enriching the fuel mixture for starting the engine. If your tractor is not equipped with the electric starter and choke rod, move the choke lever down all the way before cranking the engine. Moving the choke lever back up opens the choke for normal engine operation.

Engine Speed Control Lever

This lever controls the speed of the engine and, when set in a given position, will maintain a uniform engine speed even though the engine load may vary.

The rated or maximum full load governed speed is 1400 r.p.m.; maximum idle speed is approximately 1540 r.p.m.; minimum speed (hand throttle) is 500 to 550 r.p.m. Never operate the engine at more than the regular governed speed. Excessive speeds are harmful.

The governor is set at the factory and should require no adjustment. Consult your International Harvester dealer if the governor does not function properly.



Illust. 5—Various Positions of the Engine Speed Control Lever.

Illust. 5A—Location of Oil Pressure Indicator.

Oil Pressure Indicator

This gauge, *Illust. 5A,* shows whether lubricating oil is circulating through the engine. The indicator needle should be in the white area when the engine is running, *Illust. 5B.* If it is not in the white area, stop the engine immediately and investigate the cause of the oil pressure failure. If you are unable to find cause, be sure to consult your International Harvester dealer before operating the engine.

Illust. 5B—Oil Pressure Indicator, Showing Needle in Correct Operating Position.

Ignition Switch Button

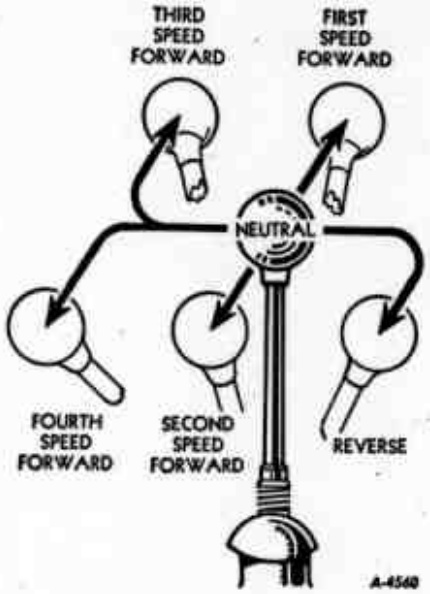
This button closes and opens the electrical circuit for starting and stopping the engine. Pull the button out for starting, and push it in to stop the engine.

Starter Rod

The starter rod is used to start and stop the starting motor. To crank the engine, pull out on the starter rod.

Gearshift Lever

This lever is used to select various gear ratios provided in the transmission. There are four (4) forward speeds and one (1) reverse speed, see *Illust. 6.*



Illust. 6—Gearshift Positions.

Light Switch

This switch operates the lights and is also used to manually control the generator output.

The switch has four positions: "L" low charge; "H" high charge; "D" dim lights; and "B" bright lights.

Ammeter

This instrument indicates the charging rate of the generator or discharge rate of battery. The ammeter should show charge whenever the engine is running. If it shows discharge continuously, investigate the cause to avoid completely discharging the battery and possible damage to the generator. *Refer to pages 39 to 44 for additional information on electrical equipment.*

Touch-Control Levers

These levers, *Illust. 4,* operate the Farmall Touch-Control system, which raises, lowers, and regulates the working depth of the various implements used with this tractor. *For complete instructions refer to pages 18 and 19.*

Belt Pulley and Power Take-Off Control Rod

The shifter rod is used to engage or disengage the belt pulley or the power take-off. *Refer to page 17 for operating instructions.*

Radiator Shutter Control Lever

The control lever opens and closes the radiator shutter controlling the engine temperature. Pull the lever all the way back to close the shutter and move the lever forward to open the shutter.

Note: Tractors with gasoline engines are not regularly equipped with this feature.

Heat Indicator

This gauge, *Illust. 6A,* registers the temperature of the liquid in the cooling system. The indicator pointer should be in the high side of the "RUN" range for engines using distillate or kerosene for fuel, and in the low side of the "RUN" range for engines using gasoline for fuel.

Note: Tractors with gasoline engines are not regularly equipped with this feature.

Illust. 6A—Heat Indicator in Correct Operating Position when Operating on Distillate or Kerosene.

Manifold Heat Control Lever

This control lever, *Illust. 7,* is used only on the distillate or kerosene engines. For normal operation set the lever in the top notch (hot) position. If the distillate or kerosene engine is to be operated on gasoline, set the control lever in the bottom notch (cold) position, and remove the manifold shield. *For complete instructions refer to pages 13 and 15.*

Illust. 7—The Heat Control Valve set in Hot position.

Before Starting Your New Tractor

Lubrication

Lubricate the entire tractor, using the "Lubrication Chart," *page 22* as a guide.

Check the oil levels of the engine crankcase, air cleaner, transmission, belt pulley housing, and all gear cases to see that they are filled to the correct levels with the proper grades of oil for the prevailing temperature, *refer to "Lubrication Chart" and to "Specifications of Lubricants" on page 27.*

Tractors shipped to destinations in the United States of America, Canada and Mexico are filled with oil in all parts before leaving the factory. Engines are filled with a light engine oil.

Tractors packed for export have all oil drained from the engine crankcase, air cleaner and all gear cases.

Before starting the engine for the first time remove the spark plugs and put about one teaspoonful of crankcase oil into each cylinder; replace the spark plugs and crank the engine to distribute the oil over the cylinder walls. This assures positive lubrication of the cylinders and pistons immediately after starting and eliminates the possibility of scoring.

Pneumatic Tires

Before moving the tractor, check the air pressure in the pneumatic tires and inflate or deflate the front tires to 28 lbs. and the rear tires to 12 lbs. *Refer to chart on page 53 for more complete information.*

Engine Cooling System

The cooling system capacity is approximately 13 U.S. quarts.

Be sure the radiator drain is closed, *Illust. 32,* then fill the radiator to a level slightly below the bottom of the filler neck. Filling the radiator to this level will allow for expansion of the coolant under normal operating conditions. Use clean water; soft or rain water is recommended as it does not contain alkali which forms scale and eventually clogs the passages.

For further information see "Cooling System," *page 32.* If the tractor is to be operated in freezing temperatures (32°F or lower) *refer to "Cold Weather Precautions" on page 31.*

Fuel System

Provision is made in the design of this tractor so that it may be equipped with either a gasoline, distillate, or kerosene-burning engine. Before attempting to use a fuel for which your tractor is not designed, see your International Harvester dealer or the nearest International Harvester Company branch for full details.

To obtain best results, use the fuel for which the tractor is designed, follow the operating instructions given for that fuel and observe the following precautions:

1. Distillate fuels should conform to International Harvester Company specifications (see your International Harvester dealer).

2. Distillate or kerosene-burning tractors should not have the shut-off valve under the auxiliary tank and the one under the main fuel tank open or even partially open at the same time, as this will permit the distillate or kerosene to mix with the gasoline, making the engine hard to start.

3. During the first 100 hours of operation, mix 1 pint of light engine oil with every 5 U. S. gallons of fuel.

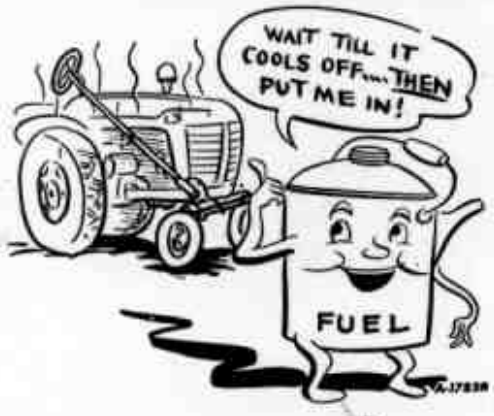
Ignition—Electrical

Check to see that the magneto "coil distributor" cable "B," *Illust. 36,* is secured in its socket on the magneto coil cover.

Tractors shipped from the factory with starting and lighting equipment have the "battery to ground" cable, *Illust. 40,* and the cable leading to the "F" terminal on the generator, *Illust. 44,* disconnected. Therefore, before attempting to start the engine, be sure that the "battery to ground" cable and the generator cable are connected to their correct terminals.

Instruments and Controls

Thoroughly acquaint yourself with all instruments and controls as described on *pages 4 to 6.*



Never Refuel Tractor While Engine Is Running or Extremely Hot.

How To Prepare Your Tractor For Each Day's Work

Fuel System

Fill the fuel tank (capacity 11 gals.) preferably at the end of each day's work. This will force out any moisture-laden air and prevent condensation.

Tractors designed for distillate or kerosene operation have an auxiliary tank (capacity ⅛ U. S. gallon) for gasoline, which is used only for starting and warming up the engine. If a distillate or kerosene engine is to be operated on gasoline only, use the large fuel tank for gasoline and either shut off the small tank or use it as an auxiliary tank.

Both fuel tanks have air vents in the filler caps. These vents should be kept open at all times to assure proper flow of the fuels, *Illust. 8A.*

Illust. 8—Filling the Fuel Tank.

Safety First: Never fill the fuel tank when the engine is running or when near an open flame. Do not smoke or use an oil lantern when working around inflammable fuels. When pouring fuel, keep the funnel and container in contact with the metal of the fuel tank, *Illust. 8,* to avoid the possibility of an electric spark igniting the gas. Do not light matches near gasoline as the air within a radius of several feet is mixed with a highly explosive vapor.

Cooling System

Remove radiator filler cap and check the water level. Fill to a level slightly below the bottom of the filler neck.

Lubrication

Air Cleaner

Change the oil in the air cleaner oil cup. Fill to level mark with engine oil. (Capacity ⅞ U. S. pint.)

Engine Crankcase

WHEN OPERATING ON GASOLINE, add sufficient oil to bring oil up to level of the upper test cock in the crankcase pan, *Illust. 23.*

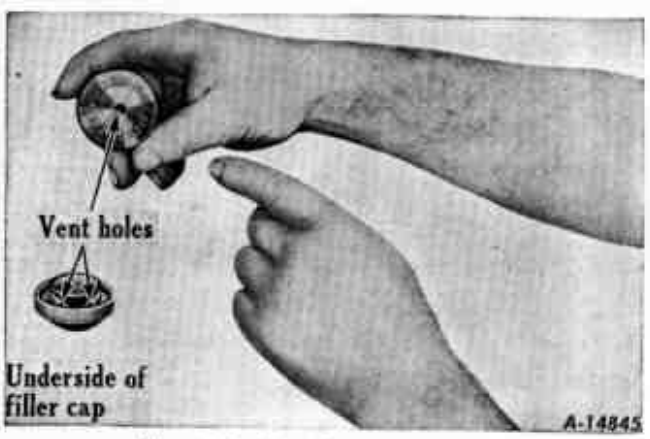
WHEN OPERATING ON DISTILLATE OR KEROSENE: before starting your engine for the day's work, open the lower test cock in the crankcase pan and allow the oil to drain to this level. Close the lower test cock and open the upper cock in the crankcase pan. Add new oil (approximately 1 U. S. pint) until it appears at this level, and then close the cock, *Illust. 23.*

Grease Fittings

Refer to "Lubrication Guide," pages 22 to 27, for complete daily lubrication requirements.

Periodic Inspections

Refer to pages 28 and 29.



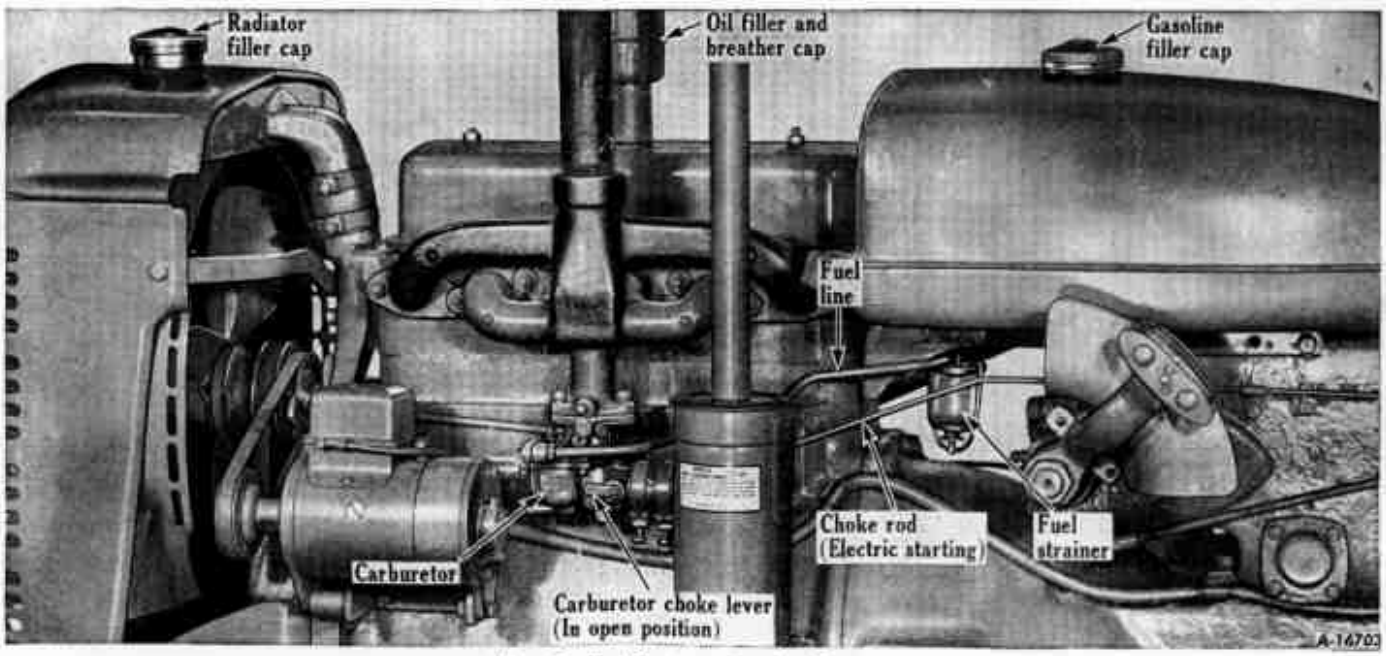
Illust. 8A—Vent Holes in Filler Cap.

OPERATING YOUR TRACTOR

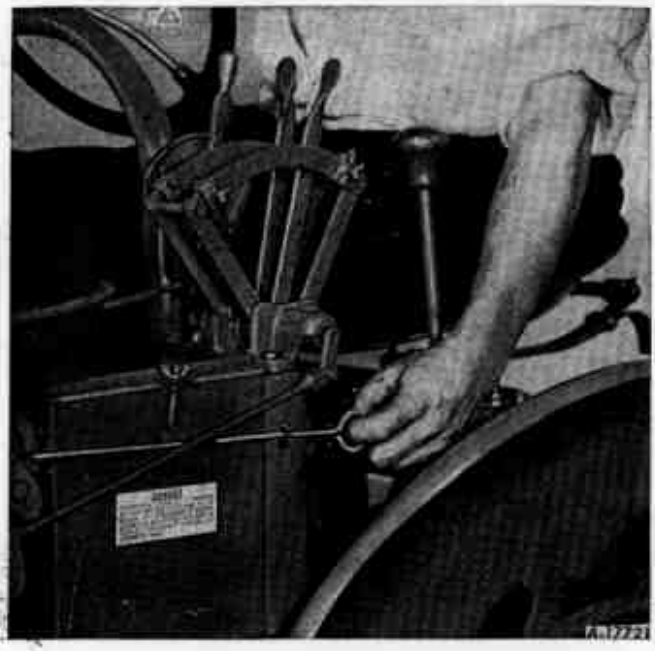
Before attempting to start or operate the tractor, be sure that you have checked over the instructions for a new tractor and thoroughly familiarize yourself with the instruments and controls.

When starting the engine in a barn or garage, keep the doors wide open as the exhaust gas from all internal combustion engines contains poisonous carbon monoxide which is odorless, tasteless and colorless.

Be sure the gearshift lever of the tractor is in neutral before starting the engine.



Illust. 9—Fuel System—Gasoline Engine.



Illust. 10—Pulling out on the Choke Rod.

Using the Choke

Avoid overchoking as excessive use of the choke will flood the engine, making it hard to start. The use of the choke for starting will vary, depending on temperature and altitude.

Illust. 10A—Pulling out on the Ignition Switch Button.

Operating a Gasoline Engine

Radiator Shutter

Tractors designed for gasoline engine operation are not regularly equipped with a radiator shutter but this feature can be supplied. If your tractor is so equipped, close the radiator shutter when starting the engine in cold weather; then regulate it as required to hold the needle of the heat indicator in the low side of the "RUN" range.

Fuel System

Check the gasoline tank to make sure that it is full; also be sure that the shut-off valve on the fuel strainer under the gasoline tank is open.

Starting the Engine with the Electric Starter

1. Put the gearshift lever in neutral position, *Illust. 6.*

2. Pull the choke rod all the way out, *Illust. 10.*

3. Advance the engine speed control lever one third, *Illust. 5.*

4. Pull out on the ignition switch button, *Illust. 10A.*

5. Disengage the engine clutch by pressing down on the clutch pedal. Pull out on the starter rod, *Illust. 11*, and release as soon as the engine starts. However, do not hold the starter rod out for more than 30 seconds at any one time. If the engine does not start within this time, release the starter rod and wait a minute or two, then try again. Slowly release the clutch pedal after the engine starts.

Hand Cranking the Engine

1. Put the gearshift lever in neutral position, *Illust. 6.*

2. Close choke by moving the carburetor choke lever all the way down, *Illust. 11A.*

3. Advance engine speed control lever one third *Illust. 5.*

4. Pull out on the ignition switch button, *Illust. 10A.*

5. Crank the engine one or two strokes, then open the choke part way.

6. Crank the engine until it starts, *Illust. 11B.*

Caution! When cranking the engine, be sure that the gearshift lever is in neutral position and always stand in a position that will eliminate any possibility of being struck by the starting crank if there is a reversal of the direction of the engine. Crank the engine by using quick upstrokes; do not spin it.

The following instructions offer approximate requirements which may be altered to suit local conditions:

During warm weather, or with the engine warm, set the carburetor choke lever in half-open position and crank engine using quick upstrokes until the engine starts.

During cold weather, or with the engine cold close the choke completely by moving the choke lever down as far as it will go, *Illust. 11A,* and crank engine with quick upstrokes as follows:

Six to eight lifts of the crank at temperatures 0° to 10° F.

Four to five lifts of the crank at temperatures 10° to 20° F.

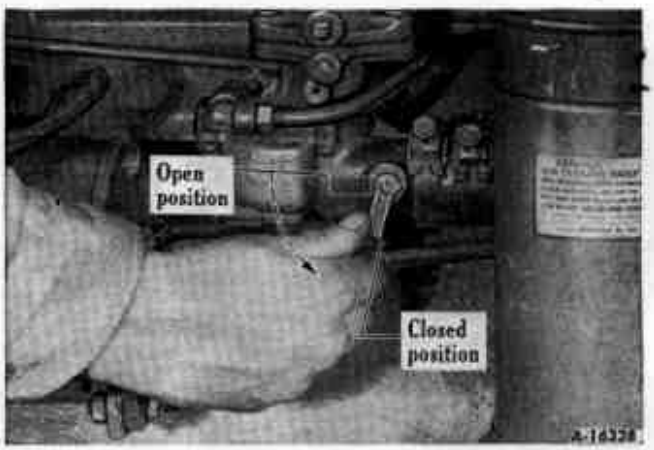
Two to three lifts of the crank at temperatures 20° to 30° F.

Now, open the choke halfway and crank the engine with quick upstrokes until it starts.

Illust. 11—Pulling out on the Starter Rod.

After Engine Starts

As soon as the engine starts, adjust the choke to a point where the engine operates without missing and as the engine warms up, gradually open the choke all the way by gradually pushing the choke rod all the way in, or by moving the carburetor choke lever up all the way, *Illusts. 10 and 11A.* Do not use the choke to enrich the fuel mixture except when starting the engine.

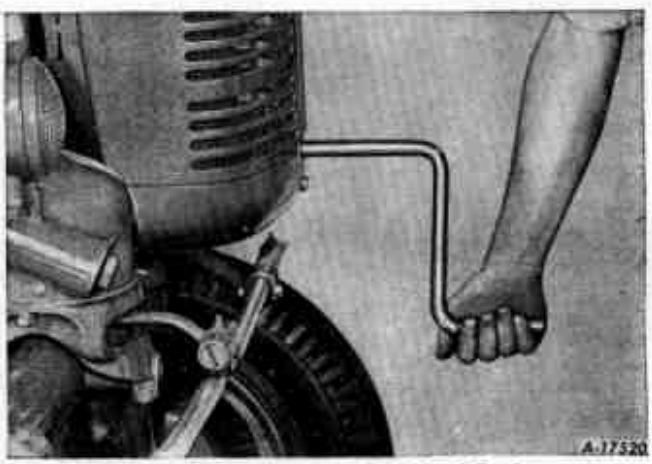


Illust. 11A—Closing the Carburetor Choke Lever.

Immediately after the engine starts, check the oil pressure indicator, *Illust. 5B,* to see whether sufficient oil is circulating through the engine. If it is not, stop the engine and inspect the oil system to find the cause of failure. If unable to find the cause, be sure to consult your International Harvester dealer before operating the engine.

Stopping the Engine

Retard the engine speed control lever by pulling it all the way back, *Illust. 5,* and push the ignition switch control button all the way in. It is advisable to close gasoline shut-off valve if the engine is to be stopped for any length of time.



Illust. 11B—Correct Method of Hand Cranking.

Operating a Distillate Engine on Distillate

Four steps are necessary in operating a distillate engine on distillate.

1. Setting the manifold heat control lever in the top notch "Hot" position, page *13*.
2. Starting the engine on gasoline.
3. Changing over to distillate fuel.
4. Changing back to gasoline before stopping the engine to insure having gasoline in the fuel bowl for the next starting.

The above steps are fully explained in this manual; please study them carefully.

Radiator Shutter

Tractors designed for operation on distillate are regularly equipped with a radiator shutter to assist in warming up a cold engine quickly and to maintain the engine at the most efficient operating temperature.

Distillate fuels are heavier than gasoline and therefore require more heat for proper vaporization. Before starting a distillate engine, close the radiator shutter completely.

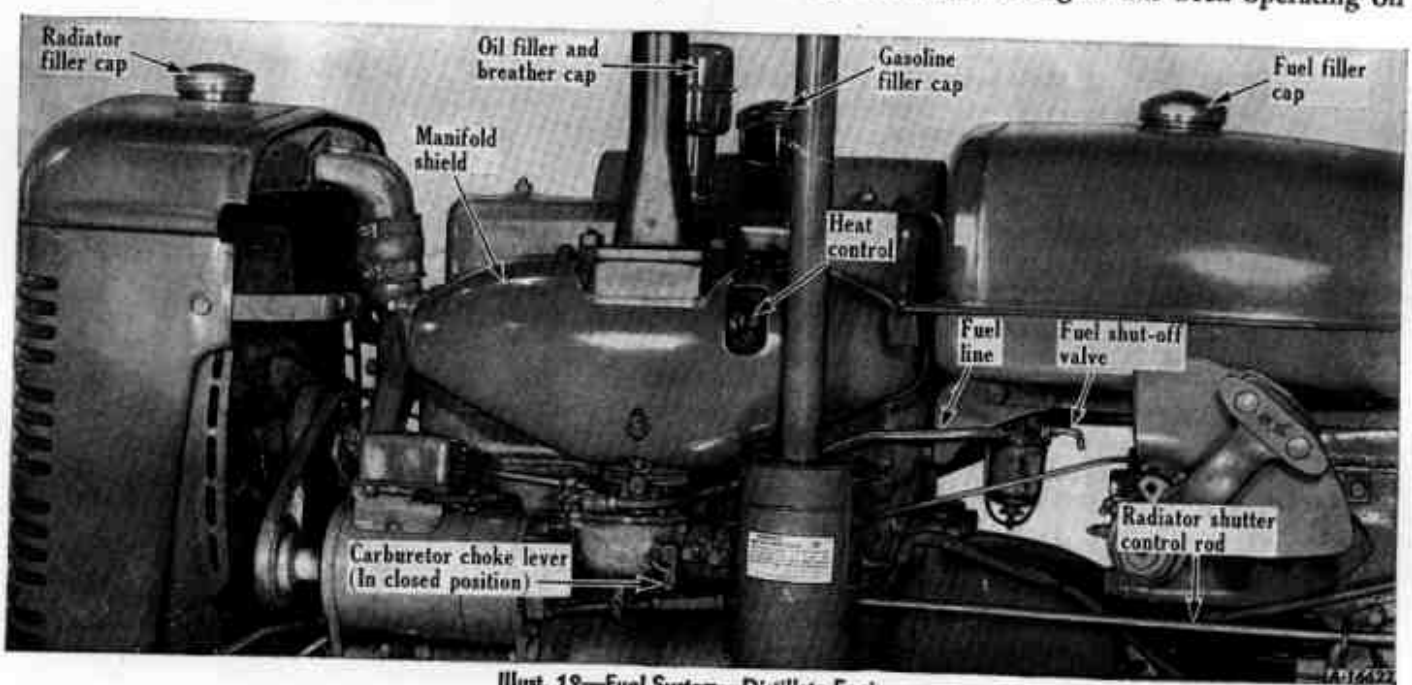
After the engine has been started, allow it to operate with the radiator shutter closed until the pointer on the heat indicator is on the high side of the "RUN" section; then regulate the shutter enough to keep the pointer on the heat indicator in this position, *Illust. 6A.*

The adjustment of the shutter will vary, depending on the load the tractor is handling, length of idling periods, atmospheric temperatures, and the kind and quality of fuel that is being used.

Important! Before filling the radiator in freezing weather, close the radiator shutter and start the engine; then put the water in the radiator immediately. This prevents water from freezing during the warming-up period. After the engine has warmed up, adjust the radiator shutter to maintain the operating temperature of the engine on the high side of the "RUN" portion on the heat indicator, *Illust. 6A.*

Fuel System

Check the fuel and auxiliary gasoline tanks to make sure that they are full. Open the gasoline valve, and be sure the shut-off valve for the main fuel tank is closed. (This shut-off valve should not be opened until the engine has been operating on



Illust. 12—Fuel System—Distillate Engine.

gasoline long enough to be thoroughly warmed up.)

Do Not Mix Fuels! Do not have the shut-off valve under the auxiliary tank and the one under the main fuel tank open at the same time as this will permit the distillate fuel to mix with the gasoline, making the engine hard to start.

Before starting the engine on gasoline, be sure that there is no distillate fuel in the carburetor or in the fuel strainer.

Manifold Heat Control

The distillate engine manifold is designed so that the hot exhaust gases pass around the intake manifold and heat the incoming fuel mixture, resulting in maximum efficiency under all normal operating conditions.

The manifold heat control valve has three adjustment positions: (1) top notch, "HOT" position; (2) center notch, "INTERMEDIATE" position; (3) bottom notch, "COLD" position, *Illust. 7.*

With these adjustments, the heat of the manifold can be regulated to suit the various operating conditions, which are governed by the prevailing air temperature, the load the engine is handling, and the kind and quality of fuel that is being used.

When operating the engine on distillate, the heat control valve should be set in the top notch, "HOT" position, *Illust. 7.* To do this, loosen the nut on the heat control adjusting lever and raise the lever to the top notch. Always keep the valve in this position except when the prevailing temperature is very high, or when the engine is operating with a constant heavy load. In such cases, use either the "INTERMEDIATE" or "COLD" positions.

The manifold should be kept hot at all times to vaporize the heavy fuels properly and to avoid dilution of the crankcase lubricating oil.

Starting the Engine with the Electric Starter

1. Put the gearshift lever in neutral position, *Illust. 6.*

2. Open the gasoline shut-off valve under the auxiliary gasoline tank, and be sure that the shut-off valve for the main fuel tank, *Illust. 12,* is closed.

3. Advance the engine speed control lever one third, *Illust. 5.*

4. Close the radiator shutter.

5. Pull out on the ignition switch button, *Illust. 10A.*

6. Pull the choke rod all the way out, *Illust. 10.*

7. Disengage the engine clutch by pressing down on the clutch pedal. Pull out on the starter rod, *Illust. 11,* and release as soon as the engine starts. However, do not hold the starter rod out for more than 30 seconds at any one time. If the engine does not start within this time, release the starter rod and wait a minute or two then try again. Slowly release the clutch pedal after the engine starts.

Hand Cranking the Engine

1. Put the gearshift lever in neutral position, *Illust. 6.*

2. Open the gasoline shut-off valve under the auxiliary gasoline tank, and be sure the shut-off valve for the main fuel tank is closed, *Illust. 12.*

3. Advance the engine speed control lever one third, *Illust. 5.*

4. Close the radiator shutter.

5. Pull out the ignition switch button, *Illust. 10A.*

6. Close the choke by moving the carburetor choke lever all the way down, *Illust. 11A.* Crank the engine one or two strokes; then open the carburetor choke halfway. Crank the engine until it starts.

Avoid overchoking as excessive use of the choke will flood the engine, making it hard to start. For best results follow the procedure outlined on *page 11.*

After Engine Starts

As soon as the engine starts adjust the choke to a point where the engine runs without missing. As the engine warms up, gradually open the choke all the way by gradually pushing the choke rod all the way in, or by moving the carburetor choke lever up all the way. Do not use the choke to enrich the fuel mixture except when starting the engine.

Immediately after the engine starts, check the oil pressure indicator, *Illust. 5B,* to see whether sufficient oil is circulating through the engine. If it is not, stop the engine and inspect the oil system to find the cause of failure. If unable to find cause, be sure to consult your International Harvester dealer before operating the engine.

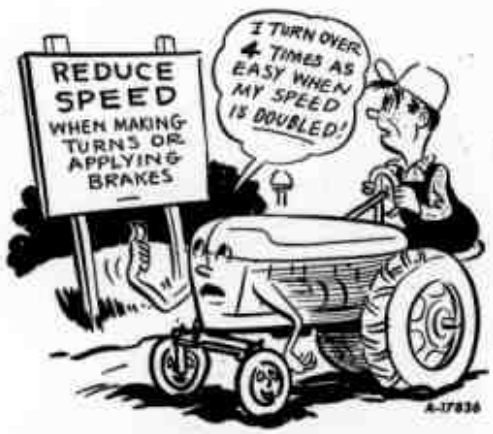
Changing Over to Distillate Fuel

When the engine has operated a while and the needle on the heat indicator is well into the "RUN" section, change over to operate on distillate by tightly closing the gasoline shut-off valve, and quickly opening the shut-off valve under the main fuel tank.

Do not operate the engine under load until it is thoroughly warmed up (when heat indicator pointer is in the high side of the "RUN" section, *Illust. 6A*).

Adjust the radiator shutter so as to maintain the needle in this position.

Loose or "floppy" clothing should not be worn by the operator because of the danger of it wrapping on or getting into the moving parts.



Reduce speed before making a turn or when applying the brakes. Remember, the danger of the tractor overturning increases four times when the speed is doubled.

Always keep the tractor in gear when going down steep hills.

Stopping the Engine

Close the distillate shut-off valve and open the gasoline shut-off valve. Operate the engine two or three minutes with the engine speed control lever one half advanced to empty the fuel lines and carburetor of distillate and fill them with gasoline. This will insure having gasoline in fuel bowl for starting again. Retard the engine speed control lever by pulling it all the way back and push the ignition switch button all the way in.

After the engine has stopped, it is good practice to close the gasoline shut-off valve.

To start an engine that has been stopped while operating on distillate and has cooled off, close the main fuel shut-off valve, drain the distillate from the carburetor fuel bowl and fuel strainer bowl; then proceed in accordance with "Starting the Engine" instructions shown on *page 13*.

Operating a Kerosene Engine

If your tractor is equipped with a kerosene-burning engine, follow the same operating instructions as outlined for distillate operation.

If this kerosene engine is to be operated on gasoline, the same instructions as for operating a distillate engine on gasoline will apply.

Operating a Distillate Engine On Gasoline

The distillate or kerosene engines may be operated on gasoline if necessary, however, more satisfactory results will be obtained when the engine is operated on the fuel for which the engine is designed.

To operate a distillate engine on gasoline, follow the same operating instructions as for distillate operation, *pages 12 to 13*, except as outlined below:

Fuel System

The 11 U. S. gallon fuel tank is used for gasoline, and the small tank may be used as an auxiliary tank.

Radiator Shutter

Close the radiator shutter when starting the engine in cold weather, and as the engine warms up, regulate the shutter so that the heat indicator pointer maintains its position on the low side of the "RUN" section.

Manifold Heat Control

Set the heat control valve in "COLD" position except when operating under a light load, or in extremely cold weather; then the valve should be set in "INTERMEDIATE" position.

Manifold Shield

Remove the manifold shield, except when operating in extremely cold weather.

To Stop the Engine

Retard the engine speed control lever by pulling it all the way back, and push the ignition switch button all the way in.

It is advisable to close the fuel shut-off valve if the engine is to be stopped for any length of time.

Driving the Tractor

To Start the Tractor

1. Advance the engine speed control lever slightly, *Illust. 5.*

2. Disengage the clutch by pressing the clutch pedal all the way in.

Illust. 15—Shifting Gears Before Starting the Tractor in Motion.

Only one person, the operator, should be permitted to ride on the tractor when it is in operation.

Be extra careful when working on hillsides. Watch out for holes or ditches into which a wheel might drop and overturn the tractor.

Always ride on the tractor seat when driving on the highway or to and from the fields. Never ride on the tractor drawbar or on the drawn implement.

Always drive the tractor at speeds slow enough to insure safety, especially when driving over rough ground or near ditches.

Never dismount from the tractor while it is in motion. Wait until it stops.

If the tractor will not move because the rear wheels have dug in or sunk deeply into the ground, don't fasten logs, posts, or anything to the rear wheels that will prevent them from rotating. This would be certain to tip the tractor over backward. Instead.....

3. Hold the clutch pedal in this position and move the gearshift lever to the desired speed, *Illust.* 6, and advance the engine speed control lever to a position where the engine operates best for the load to be handled.

4. Start the tractor in motion by slowly releasing the clutch pedal. (Note: Do not shift gears while the engine clutch is engaged or while the tractor is in motion.)

5. Do not "ride" the clutch or brake pedals by resting the feet on the pedals while driving the tractor as this will result in excessive wear on the linings.

Always latch the brake pedals together before driving the tractor in high gear. To latch the pedals together, engage the latch into the slot in back of the left pedal, *Illust.* 17. When brake pedals are not latched together, the latch should rest in the slot in back of the right brake pedal.

Steering the Tractor

The tractor is steered in the conventional manner by means of the steering wheel; however, to make a sharp or pivot turn, press either the right or left brake pedal, depending on the direction in which the turn is to be made. The brake pedals must be unlatched so they can be operated individually.

To Stop the Tractor

Disengage the clutch by pressing down firmly on the clutch pedal and move the gearshift lever to neutral position. Use the brakes if necessary.

.....dig out or jack up the rear wheels and fill in under them. Or, if another tractor is available, hitch it with a chain to the front end of the "stuck" tractor. The power of both tractors can be used, if needed, provided a heavy pull is kept on the chain all the time.

Locking the Brakes

Always lock the brakes when tractor is parked on a grade or when doing belt work. To lock the brakes, first latch the brake pedals together with latch as previously described. Now press down on the brake pedals, and lift up the brake pedal lock and let it fall forward, *see Illust. 17.* The lock will then engage with the ratchet on the brake shaft. The brake pedals will lock in this position. To release the brakes, simply press the brake pedals further down, lift the lock and let it fall back into the disengaged position.

Operating the Belt Pulley and Power Take-Off

The belt pulley and power take-off are started and stopped by the same engine clutch as the tractor. Be sure to disengage the engine clutch before moving the power take-off shifter lever.

The same shifter lever is used to operate either the belt pulley or power take-off and should always be in the disengaged (forward) position, *Illust. 18,* when the belt pulley or power take-off are not in use.

Operating the Belt Pulley or Power Take-Off with the Tractor Standing Still

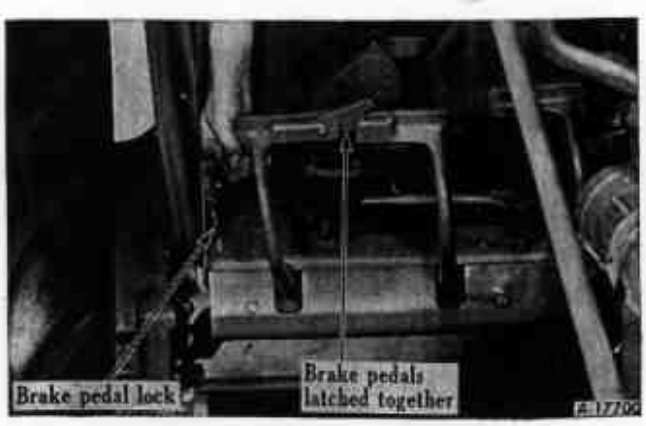
1. The transmission gearshift lever must be in neutral position.

2. Move the engine speed control lever back, to low idle speed.

3. Depress the clutch pedal to disengage the engine clutch.

4. Move the power take-off shifter lever back until shafts are in mesh, *Illust. 18.*

5. Slowly release the clutch pedal.



Illust. 17—Locking the Brakes.

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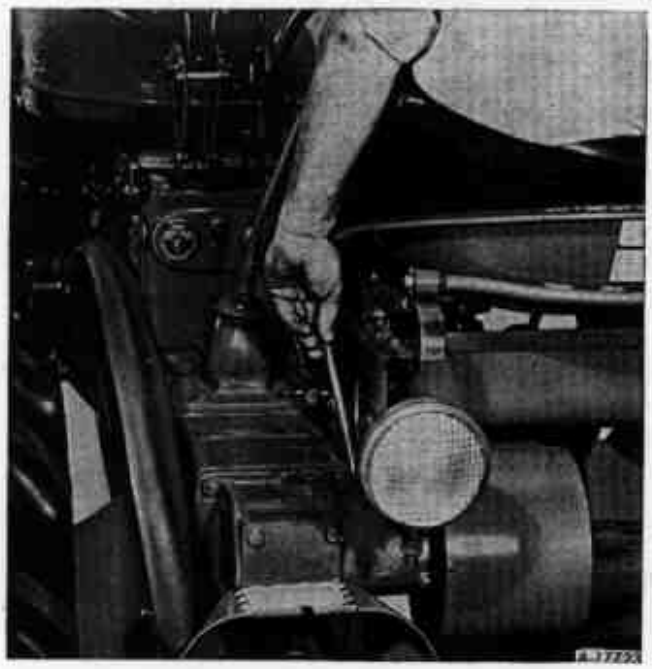
Always lock the brake pedals together when driving on the highway or when driving in high gear.
Be sure that the brakes are properly adjusted.

Always engage the clutch gently, especially when going up a hill or when pulling out of a ditch.

Always stop the power take-off before dismounting from the tractor.



Illust. 18—Operating the Belt Pulley or Power Take-Off.

Operating the Power Take-Off with Tractor in Motion

Follow the first four steps outlined above, then keeping your foot pressed down on the clutch pedal (in the disengaged position), advance the engine speed control lever and move the transmission gearshift lever to the speed that is desired to run the tractor. Slowly release the clutch pedal, which will start the tractor in motion with the power take-off in operation.

When the power take-off shaft is not in use, always keep it covered with the power take-off shaft guard.

Be sure to stop the power take-off before dismounting from the tractor.

Additional Information and Precautions

1. The power take-off shaft speed is 541 r.p.m.; belt pulley speed, 1,157 r.p.m.; belt speed with an 8½-inch diameter pulley is 2,574 feet per minute

2. When operating the power take-off, be sure that the master shield, *Illust. 66*, is always in place covering the power take-off exposed shaft.

When the power take-off shaft is not in use, it should be covered with the power take-off shaft guard.

3. When the belt pulley is not in use the pulley can be removed and the exposed shaft covered with spacer and pulley shaft guard.

4. If you desire to use the tractor with the belt pulley unit temporarily removed, the shims should be left in place and the power take-off cover installed. When reassembling the belt pulley unit be sure these shims are in place as the size and number of these shims will change the tooth contact of the gears. See your International Harvester dealer if adjustment for tooth contact becomes necessary.

Note: Static electricity in tractors equipped with pneumatic tires doing belt work—The static electricity generated by belt work can be discharged harmlessly by attaching a chain to the tractor and letting it touch the ground.

For additional belt pulley and power take-off information, *refer to page 66.*

Farmall Touch-Control System

The Farmall Touch-Control system provides hydraulic power with convenient fingertip control for raising, lowering and adjusting the working depth of the various implements used with this tractor. Implements can be regulated and adjusted without stopping work while the tractor is in motion or while standing still.

Two control levers are provided to give the operator complete, instantaneous and effortless control of all direct connected implement operating adjustments. These levers can be used separately or both at the same time. The use of these levers will depend on the type of implement mounted on or pulled by the tractor. Complete instructions for operating the control levers will be included in the owner's manual furnished with the implement. General instructions for operating these levers are given below.

Each control lever quadrant is provided with a pair of adjustable clamps; one is called the "Touch-Control lever stop" and the other one is called the "Touch-Control lever indicator."

The "stops" when set in a given position will limit the travel of the control levers and prevent the implements from being raised above the desired height.

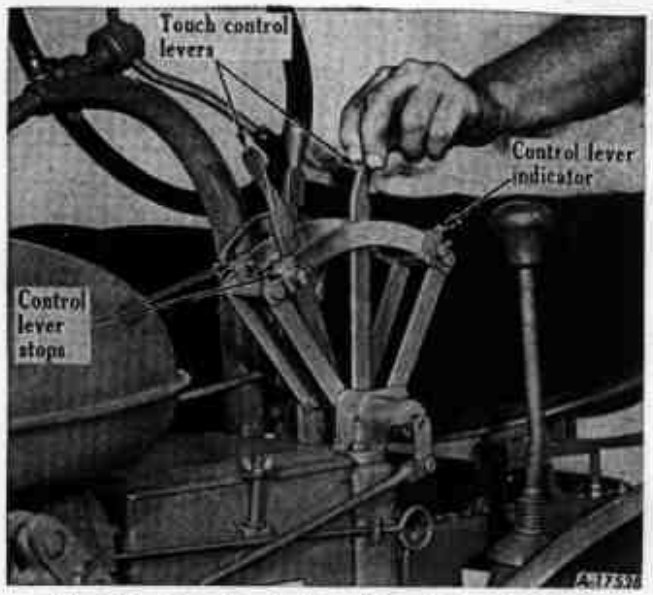
The indicators are used to point out the position where the control levers should be each time the implement is lowered to maintain a uniform working depth.

To Operate the Touch-Control System

To lower the implement, move the control lever back until the implement has reached the desired working depth, then move the "indicator" to this position and tighten in place.

The working depth will be maintained by moving the lever back to the indicator each time the implement is lowered. The implement may be lowered further when necessary by moving the lever past the indicator.

After attaching the implement to the tractor, the Touch-Control stop must first be properly set, if there is a possibility of the implement not clearing the underside of the tractor. Once the "stop" is set, the implement can be raised quickly by a flick forward on the control lever.



Illust. 19—Operating the Farmall Touch-Control System.

To set the Touch-Control stop, slowly move the control lever forward to raise the implement and stop it before the implement hits any part of the underside of the tractor. Then move the "stop" up against the control lever and tighten it in this position. This will prevent the control lever from being moved past the point of the desired lifting height.

Note: If the implement hits the underside of the tractor in addition to doing possible damage to the tractor or implement, the Touch-Control system will not have completed its cycle and this will cause the pump unit to operate at maximum high pressure and heat the oil excessively, thereby causing possible internal damage to the pump. This condition can be quickly detected by a noticeable loading of the engine.

If this condition should occur, immediately move the control lever back and set the control lever stop at a point where the raised implement will not hit the underside of the tractor.

For additional information, refer to page 55.

Careless use of the tractor and other farm machinery is the cause of most farm accidents. The safety rules shown throughout this manual are based on a careful study of thousands of farm accidents . . . . Study them carefully and follow them, and insist that they be followed by those working for you.

Remember, an accident is usually caused by someone's carelessness, neglect or oversight.

LUBRICATION

The life of any tractor depends upon the care it is given. Proper lubrication is a very important part of that care.

General Engine Lubrication

The engine has a pressure-feed lubrication system. A gear-type oil pump circulates the lubricating oil under pressure to the crankshaft bearings, connecting-rod bearings, camshaft bearings, valve mechanism, timing gears, and governor, thereby assuring positive lubrication of all parts.

The engine is equipped with an oil filter which continually cleans the oil while the engine is running. To obtain the full benefit from the filter, replace the used element with a new one every time the oil is changed in the crankcase (after every 120 hours of operation). Cleaning the old element is not satisfactory.

To pour oil into the engine, remove the breather from the oil filler pipe on the valve housing, *Illust. 22A.* Test cocks are located on the side of the crankcase pan, which indicate the high and low level of the oil. The oil should never be above the high level or below the low level, *Illust. 23.*

Never check the oil level while the engine is operating.

Oil Pressure Indicator

The oil pressure indicator shows whether sufficient oil is circulating through the engine. Under all operating conditions, the oil pressure of the engine should hold the indicator in the white section, *Illust. 5B.* Should the indicator not register, stop the engine at once and inspect oil system to find the cause of failure. If unable to find the cause, consult your International Harvester dealer before operating the engine.

Always look at the oil pressure indicator immediately after starting the engine.

Don't oil or grease the tractor while the engine is running.

Oil Pump

The gear-type oil pump in the crankcase has a screen attached to the oil intake to stop large dirt particles from entering the oiling system. This screen should be cleaned whenever the oil pan is removed. The oil intake floats on top of the oil in crankcase and draws the oil from the surface, thereby eliminating the possibility of mixing water or sediment with the oil.

Breather

The crankcase breather cap, which is also the cap for oil filler pipe, is located on the top of the valve housing. Remove the breather cap and clean it after every 120 hours of operation, and under severe dust conditions, more frequently.

To clean, wash the breather cap in kerosene, dip in engine lubricating oil, and replace after wiping off excess oil.

Oil Filter

The life of your engine depends upon clean oil being circulated to all bearings. Every good tractor operator knows that dirt and other injurious materials eventually get into the crankcase of the engine and that in the normal course of engine operation the lubricating oil undergoes changes which produce sludge, acids, gums, varnish, and other harmful byproducts.

The purpose of the oil filter is to separate and remove the dirt and other foreign substances from the oil to prevent these injurious materials from being circulated to the engine. This filter is so efficient it will keep the circulating oil free of harmful materials for 120 hours of opera-

A-9181

Illust. 21—Removing Dirty Oil Filter Element.

A-9182

Illust. 21A—Installing New Oil Filter Element.

tion—at which time the crankcase oil should be changed and the inexpensive filter element replaced. *Refer to page 27* for the recommended oil to use for the prevailing temperature. By following the simple, common-sense procedure for keeping dirt and oil impurities away from precision-made engine parts, you will safeguard your tractor engine against undue wear and the operating troubles and upkeep expense which are a natural result of that condition.

Note: To avoid delays, we recommend that you carry extra elements on hand so that replacement can be made at the proper time.

To Change Filter Element

1. Do not change the element while the engine is running.

2. Remove the oil filter base drain plug and allow the oil filter to drain completely.

3. Clean off the filter case to prevent dirt from dropping into the base.

4. Unscrew and remove the retaining bolt.

5. Lift up and remove the case.

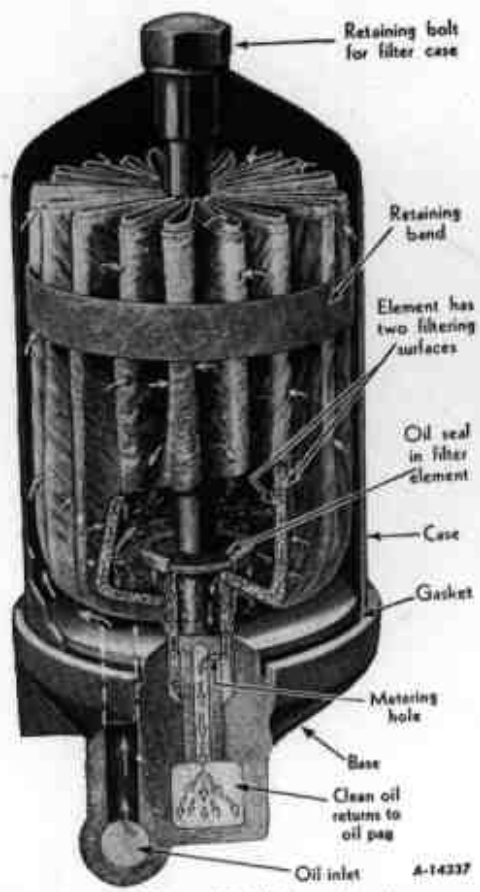
6. Remove the old element.

Note: If some special equipment on the tractor prevents lifting of the case over the element, remove the case and the element together.

7. Wipe out the base and the case with a cloth dampened with kerosene.

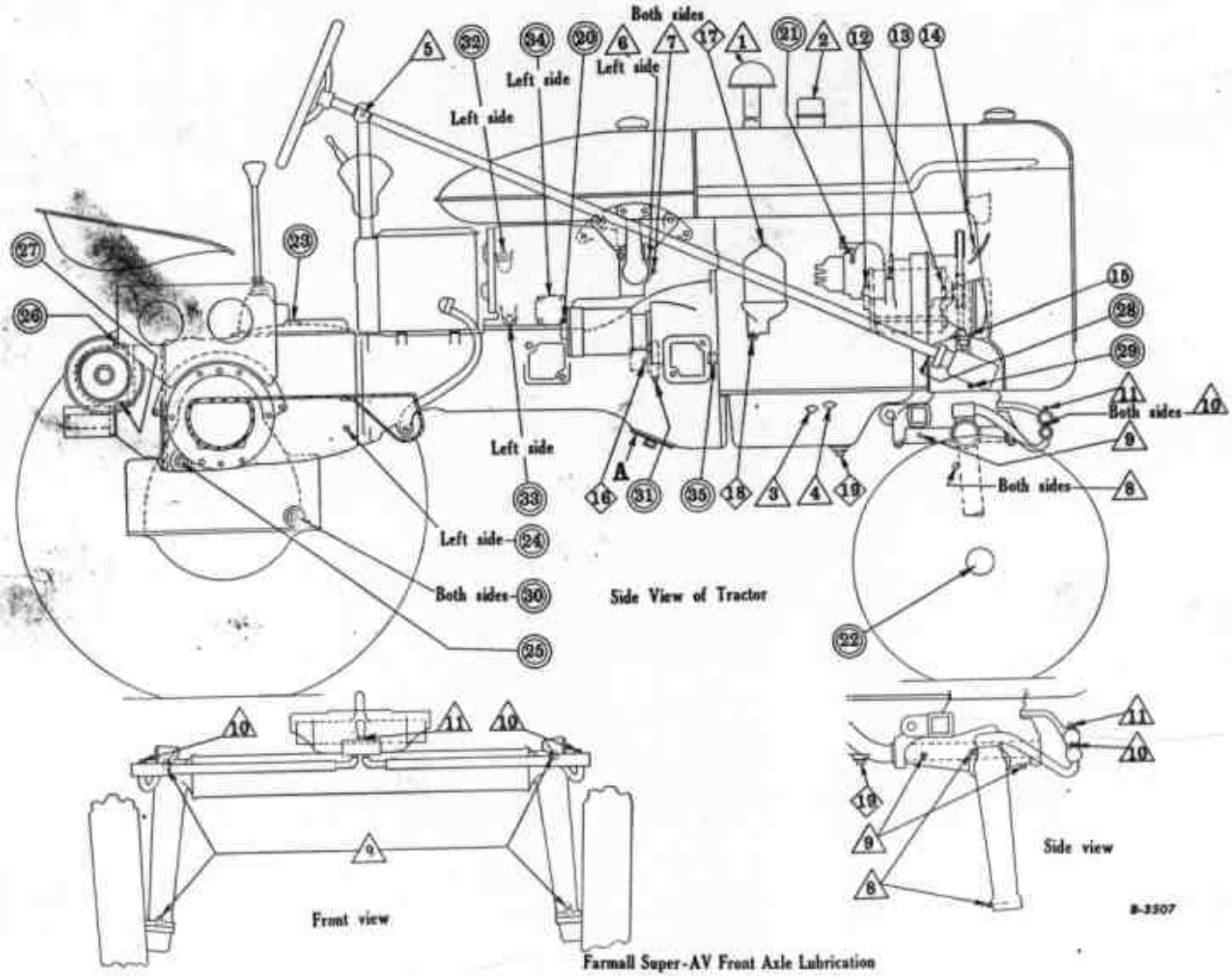
8. Replace the drain plug in the filter base and install the new filter element. Leave the retaining band on the element. Make sure the case gasket is in position. Replace the case and retaining bolt, being careful not to jam the retaining bolt down into the filter seal located inside the filter element. Lower the retaining bolt carefully and screw it through the seal, into the filter base and tighten securely.

9. Check the oil level in the crankcase to see that the new oil is up to the proper level. *See "Lubrication Guide."* Now start up the engine, check the oil pressure indicator to see whether sufficient oil is circulating through the engine, and inspect the filter for oil leaks.



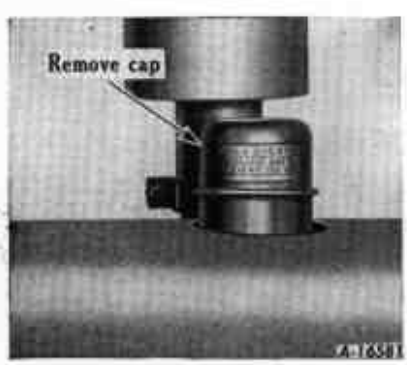
Illust. 21B—Cutaway View of Oil Filter showing passage of oil through both inside and outside surfaces of the new accordion-pleated filter element.

Lubrication Guide



Farmall Super-AV Front Axle Lubrication

Illust. 22—Air Cleaner Oil Cup.



Illust. 22A—Crankcase Oil Filler.

Key to Lubrication Guide

The symbols shown around the reference numbers on the lubrication chart on *page 22* indicate the intervals of lubrication.

Paragraph numbers on the left-hand side of the lubrication guide correspond with reference numbers on the lubrication chart.

Detail specifications of the lubricants are listed on *page 27.*

△—Daily or After Every 10 Hours of Operation

1—Air cleaner.

Clean and refill the oil cup to the oil level bead with the same new oil as used in the engine crankcase. (Capacity ¾ U. S. pt.) *Refer to page 34 for more information. Refer to Illust. 22.*

2—Oil filler.

3—Lower oil level test cock.

4—Upper oil level test cock.

When operating on gasoline: add sufficient new oil through the crankcase oil filler to bring the oil up to the level of the upper test cock (4).

When operating on distillate: Before starting the engine for the day's work, drain the oil down to the lower test cock and add new oil as follows:

Open the lower test cock (3) in the crankcase pan and allow the oil to drain to this level. Close the lower test cock and open the upper cock (4); then add new oil through the crankcase oil filler until the oil appears at the upper cock. (Approx. 1 pt.) Close the cock. Do not check the oil level while the engine is operating or operate the engine if the level of the oil is below the lower test cock. *Refer to Illusts. 22A and 23.*

5—Steering shaft support bracket.

6—Rockshaft arm.

7—Rockshaft bearings (2).

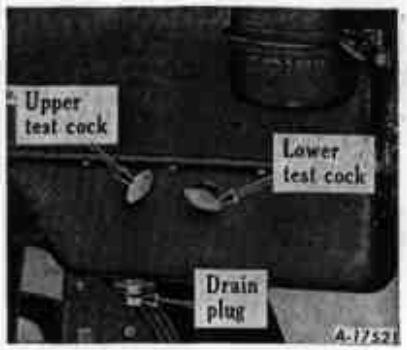
8—Steering knuckle post
for Super-A (2).
for Super-AV (4).

9—Front axle pivot
for Super-A (1).
for Super-AV (2).

10—Tie rod (2).

11—Tie rod ball seat (1).

Use pressure-gun grease (chassis lubricant) and apply 2 or 3 strokes of lubricator, or sufficient grease to flush out the old grease and dirt. *Refer to Illusts. 23A to 23D inclusive.*



Illust. 23—Oil Level Test Cocks.

Illust. 23A—Steering Shaft Support Bracket.

Illust. 23B—Rockshaft Arms and Bearings.

Illust. 23D—Front Axle (Farmall Super-AV only.)

Illust. 23C—Front Axle (Farmall Super-A only.)

Illust. 24—Generator.

○—Weekly or After Every 60 Hours of Operation

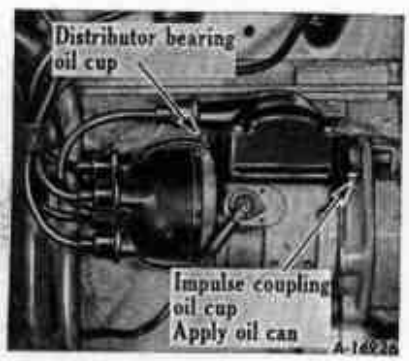
12—Generator oil cups (2). Use an oil can and apply 8 to 10 drops of SAE-20 oil in each cup. *Refer to Illust. 24.*

13—Impulse coupling. Use a light oil such as sewing machine or cream separator oil and oil liberally. Use kerosene when temperature is below 10°F. *Refer to Illust. 24A.*

14—Fan hub. Turn the fan hub so that the oil retainer screw (14) is to the left-hand horizontal position. Remove the screw and fill hub to the level of the filler hole opening with engine oil. Now turn the fan hub so that the oil filler hole is on the bottom, to allow excess oil to drain off. Replace oil retainer screw. *Refer to page 34 for more information. Refer to Illust. 24B.*

15—Steering worm wheel shaft bearing. Use pressure-gun grease (chassis lubricant) and apply two strokes of the lubricator. *Refer to Illust. 25D.*

Miscellaneous Parts Lubricate the clutch and brake pedal connections with a few drops of engine oil.



Illust. 24A—Magneto.

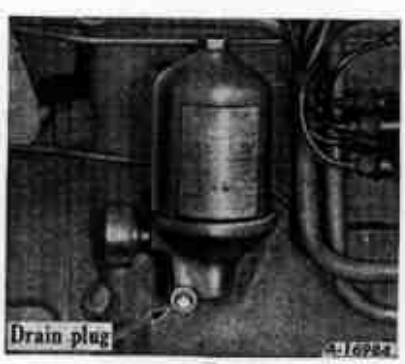
◇—After 120 Hours of Operation

16—Clutch release bearing retainer. Use pressure-gun grease (chassis lubricant) and apply 2 or 3 strokes of the lubricator. Do not overlubricate. The fitting can be reached by removing the clutch housing dust cover from the left-hand side of the clutch housing. *Refer to Illust. 24C.*

17—Oil filter element.
18—Oil filter drain plug. Replace the oil filter element every time the crankcase oil is changed. Remove the oil filter drain plug (18) and allow all the oil to drain out. Remove the oil filter retaining bolt and case and remove the used filter element. Replace the drain plug and install new filter element as instructed on *page 21. Refer to Illust. 24D.*

Illust. 24B—Fan Hub.

Illust. 24C—Clutch Release Bearing Retainer.



Illust. 24D—Oil Filter.

Illust. 24E—Crankcase Drain.

19—Crankcase oil pan drain plug.

Remove plug (19) and drain all oil from the crankcase while the engine is warm, and refill with new oil to the level of the upper test cock (4). Crankcase pan capacity is 5 U. S. quarts, *refer to Illust. 24E. For the correct lubricating oil to use refer to lubrication specifications, page 27.*

◎—Periodical

20—Starting motor.

After every 300 hours of operation put a few drops of SAE-20 oil in the starting motor oil cup. *Refer to Illust. 25. Refer to page 42 for more information.*

Illust. 25—Starting Motor.

21—Magneto distributor bearing.

After every 500 hours of operation, fill the distributor bearing oil cup with very light oil such as cream separator or sewing machine oil. *Refer to pages 35 and 36 for complete information on magneto lubrication. Refer to Illust. 24A.*

22—Front wheels.

Once every 6 months, remove, clean, and repack front wheel bearings with pressure-gun grease (chassis lubricant). *Refer to page 26 for further instructions.*

Illust. 25A—Transmission Filler Plug.

Transmission

23—Oil filler plug.
24—Oil level plug.
25—Oil drain plug.

Check the oil level periodically. Use approved lubricant, *page 27*, and keep the lubricant up to the level plug (24) on left front side of transmission case, *Illust. 25B.* Change the oil in the transmission case at least once a year. However, do not drive the tractor more than 1,000 hours without changing the oil. Remove the drain plug (25) and allow all the oil to drain out, *Illust. 25C.* Replace the drain plug and remove the filler plug (23) and level plug (24). Refill with approved lubricant up to the level plug opening and replace the plugs, *Illusts. 25A and 25B.* If the oil in the transmission case has been thinned with kerosene for operating in temperatures below zero, change the oil before operating in warm weather. *For capacity of the transmission case refer to lubrication specifications, page 27.*

Illust. 25B—Transmission Oil Level Plug.

Belt Pulley Housing

26—Inspection hole plug.
27—Drain plug.

The belt pulley is automatically lubricated from the transmission, therefor plug (26) is used only as an inspection hole plug. Remove drain plug (27) and allow all the oil to drain out of the belt pulley housing each time the oil is changed in the transmission. *Refer to Illust. 25C.*

Illust. 25E—Rear Axle Housing Right Hand Side.

Illust. 25D—Steering Gear Housing.

Illust. 25C—Transmission, and Belt Pulley Housing Drain Plugs.

Steering Gear Housing

28—Filler and level plug.
29—Drain plug.

Check periodically and add sufficient approved lubricant to level of plug (28).

Keep the hole in the vent plug, *Illust. 25D*, open at all times to release pressure which may build up due to temperature changes.

Change the oil at least once a year. However, do not operate the tractor more than 1,000 hours without changing the oil.

Once a season, or when necessary, drain by removing plug (29) and refill with new lubricant. Capacity 1 U. S. quart. *Refer to Illust. 25D.*

30—Rear axle housing oil filler and level plugs.

Check the oil level periodically and keep the lubricant up to the level of filler plug. Use approved lubricant. Change the oil at least once a year. However, do not drive the tractor more than 1000 hours without changing the oil. Drain and refill to level of plug (30). *Capacity 3 U. S. pints on each side.* To drain, remove rear axle housing pan. Clean the pan and replace it. *Refer to Illust. 25E.*

31—Clutch release bearing.

Use pressure-gun grease (chassis lubricant). After every 1,000 hours or at least once every year apply a few strokes of the lubricator to the clutch release bearing fitting (31) or just enough grease until it starts to come out of the bleeder hole on top of the bearing retainer. To reach the fitting, remove the clutch housing handhole cover "A." *Refer to lubrication chart. Also refer to Illust. 24C.*

Touch-Control Oil Reservoir

32—Filler and level plug.
33—Drain plug.
34—Oil strainer.

Refer to page 55.

35—Clutch pilot bearing.

Does not require lubrication (oil-less bushing).

Greasing Front Wheels

Removing and Greasing

To grease the front wheels, raise the front end of tractor until the wheel clears the ground. Remove hub cap "A," remove cotter pin, remove nut "B" and washer "F." Remove bearing "C" and place in hub cap "A" or a clean container; then remove wheel. Clean inside of hub "D," remove the old grease from the bearings, clean the bearings with kerosene and repack them with pressure-gun grease (chassis lubricant).

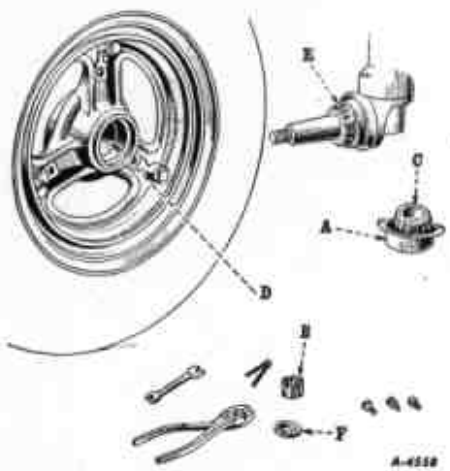
It is advisable to leave bearing "E" on the axle and clean it with a brush and kerosene. Repack the rollers with new grease before reassembling the bearings.

Inspect the oil seal and felt washer and if they are not in satisfactory condition, replace them with new ones. A dirt deflector is also provided on the axle to prevent dirt from entering at the inner bearing.

Replacing and Adjusting

Reassemble the wheel, tighten nut "B" until wheel binds slightly, rotating the wheel at the same time. Back the nut off one castellation from the cotter pin hole; replace the cotter pin and hub cap.

Be sure to keep all parts clean.



Illust. 26—Wheel Removed for Cleaning and Greasing.

Engine and Chassis Lubricant Specifications

Point of Lubrication	Capacity	Anticipated Air Temperature		
		Above 32°F	32° to 10°F	Below 10°F
Engine crankcase	5 qt.	SAE-30	SAE-20W	SAE-10W
Air cleaner oil cup	¾ pt.	SAE-30	SAE-20W	SAE-10W
Magneto	.....	Light oil*	Light oil*	Light oil*
Generator	.....	SAE-20	SAE-20	SAE-20
Starting motor	.....	SAE-20	SAE-20	SAE-20
Transmission case without power take-off and belt pulley	4½ qt.	SAE-90	SAE-90	SAE-90†
With power take-off only	5 qt.			
With power take-off and belt pulley, or belt pulley only	5½ qt.			
Rear axle housing	1½ qt. Each	SAE-90	SAE-90	SAE-90
Steering gear housing	1 qt.	SAE-90	SAE-90	SAE-90†
Touch-Control oil reservoir (refill)	6¾ pt.	SAE-10W	SAE-10W	SAE-10W
Grease fittings ††	.....	Chassis lubricant	Chassis lubricant	Chassis lubricant

*Magneto distributor bearing and impulse coupling: Use a very light oil such as cream separator or sewing machine oil for all temperatures above 10°F. Use kerosene in impulse coupling for temperatures below 10°F. Refer to *page 36* for further information.

†Refer to "Gear Lubricant," at bottom of page, for diluting with kerosene in cold weather.

††Use pressure-gun grease (chassis lubricant) for fittings on which hand lubricator is applied, for all temperatures.

Lubricating Oil and Grease Specifications

Engine Oil

Engine lubricating oil should be of well-refined petroleum oils, free from water, sediment, and without admixtures of fatty oils, acids, soaps, resins or any other substance not derived from petroleum. Oil should not corrode any metal used in engine construction. Also engine lubricating oil containing additive products not necessarily derived from petroleum, but being of noncorrosive type, is satisfactory for use in our engine.

To Aid Starting

To facilitate starting, the selection of crankcase lubricating oils should be based on the lowest anticipated temperature for the day. It is not necessary to change the crankcase oil every time the temperature rises or falls into another temperature range during some part of the 24-hour day.

Also refer to Cold Weather Precautions on *page 31*, for special instructions.

Gear Lubricant

Tractors are shipped from the factory with SAE-90 oil in the transmission, steering gear, and rear axle housings.

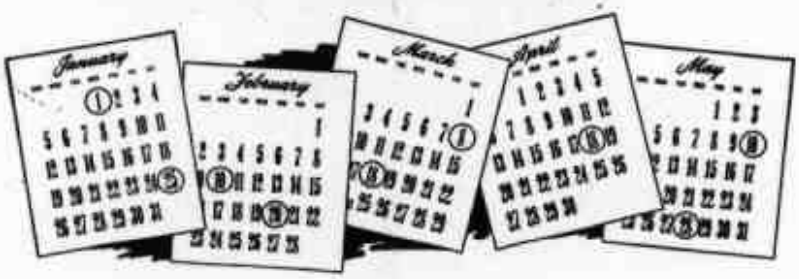
For all temperatures above zero, use SAE-90 transmission lubricant. For temperatures below zero, use the same transmission lubricant as for above zero, but also pour 1½ U.S. pints of kerosene into the transmission case, and 1½ U.S. pints of kerosene into each rear axle housing.

After the kerosene is put in, run the tractor until the mixture is thoroughly warm. Then drain to the level plug. Replace the plug.

Use a good grade oil, free from solid materials. Use only high quality lubricating oils and grease. For your own protection, select only oils and grease of recognized manufacture.

Keep your supply of lubricating oil absolutely clean and free from dust. Always use clean containers. Keep the lubricator clean and wipe dirt from grease fittings before applying the lubricator.

MAINTENANCE



Periodic Inspections

To keep your tractor performing efficiently, it is advisable to systematically inspect the following points at the intervals as outlined below.

After Every 10 Hours of Operation

Air cleaner cap.....Remove dirt or chaff, *page 34.* (*When unusual dust or dirt conditions are encountered during operation, it may be necessary to service this point more frequently.*)

Lubrication points.....See "Lubrication Guide."

Air cleaner oil cup.....Remove, clean and refill, *page 34.*

Cooling system.....Check level of coolant in radiator, *page 32.*

Fuel tank.....Fill with a good grade of fuel.

After Every 60 Hours of Operation

Air cleaner, complete.....Remove and clean, *page 34.* (*When unusual dust or dirt conditions are encountered during operation, it may be necessary to service this point more frequently.*)

Flexible rubber connection between air cleaner and carburetor.....Inspect for loose fit or damage.

Fan belt and generator belt.....Check tensions; replace when necessary, *page 33.*

Radiator fins.....Clean spaces, *page 33.*

Lubrication points.....See "Lubrication Guide."

Storage battery.....Check liquid level and specific gravity, *pages 43 and 44.*

After Every 120 Hours of Operation

Crankcase breather cap.....Remove and clean.

Lubricating oil filter.....Replace filter element, *page 21.*

Engine crankcase.....Drain and change oil.

Lubrication points.....See "Lubrication Guide."

After Every 250 Hours of Operation

Fuel strainer and sediment bowl.....Take apart and clean, *page 29.*

Spark plugs.....Remove and clean; check gap, *page 35.*

Magneto breaker points and chamber.....Clean chamber and check gap, *page 36.*

Magneto drive chamber and impulse coupling.....Check and clean if necessary, *"Cold Weather Precautions," page 31.*

After Every 400 Hours of Operation

Fuel line screen (at carburetor).....Remove and clean, *page 29.*
Cooling system.....Clean, *page 32.*
Engine valves.....Check for clearance, *page 56.*
Clutch pedal.....Check for free movement, *page 46.*
Brake pedals.....Check for free movement and equalization, *page 45.*
Lubrication points (500 hours).....See "Lubrication Guide" (Periodical).

After Every 6 Months

Front wheels.....Clean and repack with new grease, *page 26.*
Lubrication points (1000 hours).....See "Lubrication Guide" (Periodical).

Fuel Strainer

Cleaning the Fuel Strainer and Sediment Bowl

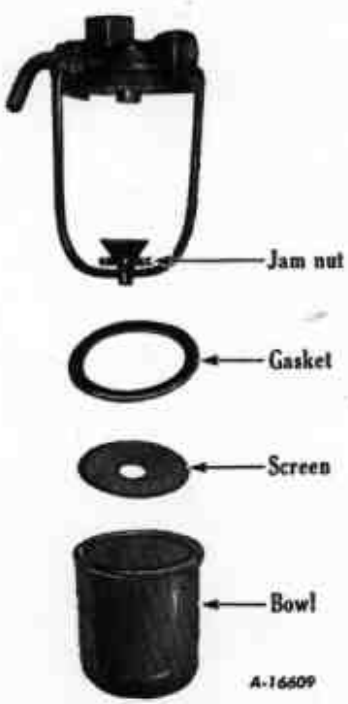
Clean the fuel strainer after every 250 hours of operation. To do this, proceed as follows:

1. Close all shut-off valves.

2. Take the strainer apart by loosening the lower jam nut.

3. Clean out the sediment bowl and clean the screen if necessary.

4. When reassembling, be sure that the cork gasket between the bowl and the main body is in good condition and does not leak. Use a new gasket if necessary.



Illust. 29—Fuel Strainer Showing Glass Bowl Removed for Cleaning.

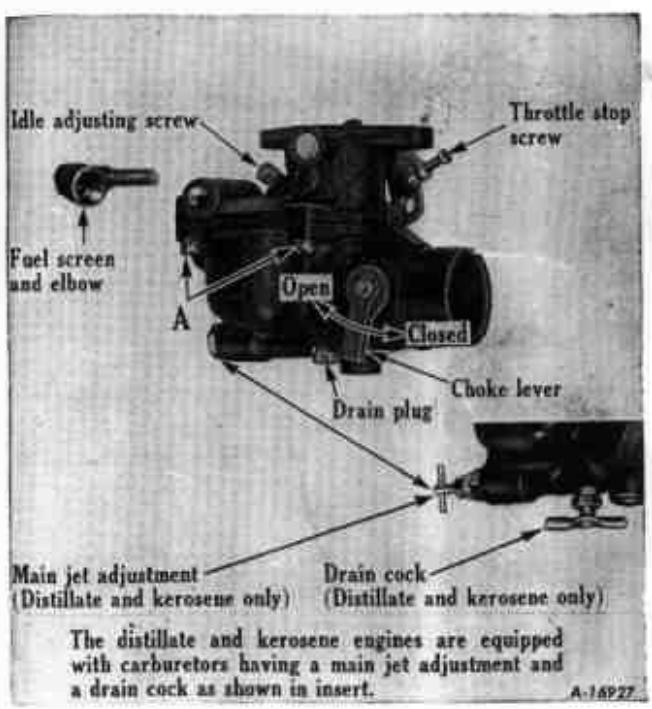
Carburetor

Use clean fuel, the presence of dirt and water will disturb the functioning of the carburetor. Clean the fuel screen after every 400 hours of operation.

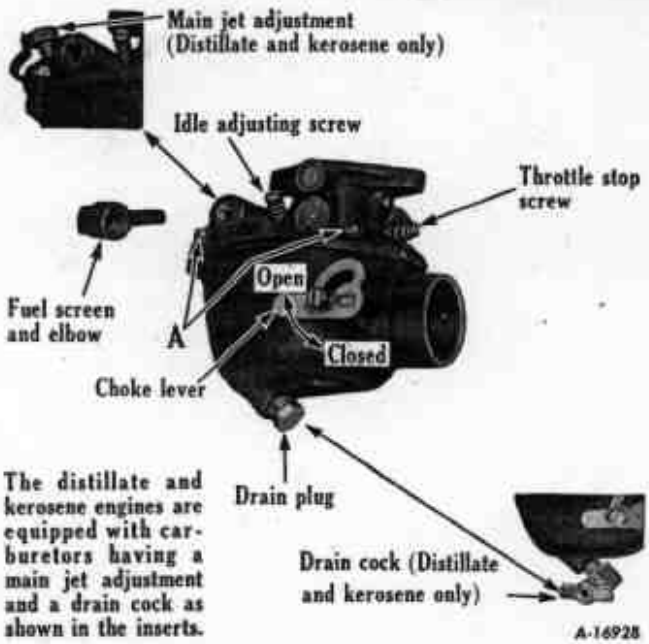
The fuel screen can be removed for cleaning by unscrewing fuel line fitting and removing elbow—clean the screen and replace it.

The flange nuts which hold the carburetor to the manifold should be checked periodically for tightness.

Occasionally check the cover screws "A," *Illusts. 29A and 30,* which fasten the fuel bowl to fuel bowl cover. They should be kept tight to avoid any air leakage past the fuel bowl cover gasket.


Idle adjusting screw
Throttle stop screw
Fuel screen and elbow
A
Open
Closed
Choke lever
Drain plug
Main jet adjustment (Distillate and kerosene only)
Drain cock (Distillate and kerosene only)
The distillate and kerosene engines are equipped with carburetors having a main jet adjustment and a drain cock as shown in insert.
A-16927

Illust. 29A—Zenith Gasoline Carburetor Showing Adjustments. (The distillate or kerosene carburetor is similar except for parts shown in the insert.)


Main jet adjustment
(Distillate and kerosene only)
Idle adjusting screw
Throttle stop screw
Fuel screen and elbow
Open
A
Closed
Choke lever
Drain plug
The distillate and kerosene engines are equipped with carburetors having a main jet adjustment and a drain cock as shown in the inserts.
Drain cock (Distillate and kerosene only)
A-16928

Illust. 30—Marvel Schebler Gasoline Carburetor Showing Adjustments. (The distillate or kerosene carburetor is similar except for parts shown in the inserts.)

The engine and carburetor are correctly set when shipped from the factory. If, for any reason, this setting has been disturbed, the following procedure should be followed:

Adjusting Idle Adjusting Screw

Close the idle adjusting screw to its seat by turning to the right (or in), then open one turn. Start the engine and operate it at the fast idling speed (without any load) until thoroughly warm. (Cover the radiator if necessary or close the radiator shutter if the tractor is so equipped.)

While the engine is running at fast idle speed it is advisable to screw in the throttle stop screw a few turns to prevent the engine from stopping when the throttle is closed. Now close the throttle by pulling the engine speed control lever all the way back. The engine will then be idling at a fairly high speed and the throttle stop screw can be backed out a little at a time until the desired idle speed is obtained. If the engine misses or rolls while backing out the throttle stop screw, the idle adjusting screw may be adjusted either in or out until the engine operates smoothly. Speed up the engine for a few seconds; then recheck the idle adjustment. A slight adjustment in or out will give the smoothest idle.

Main Jet Adjustment

(For Distillate or Kerosene Carburetors Only)

If your tractor is equipped for distillate or kerosene operation, set the manifold heat control valve in "Hot" position, *Illust. 7*, and allow engine to operate on gasoline until thoroughly warmed up. The pointer on the heat indicator should be on the high side of the "RUN" section. Then change over to operate on distillate or kerosene and operate the engine a short time before making adjustments.

To regulate the main jet adjustment, advance the engine speed control lever to fast idle position (push forward to advance), and turn the main jet adjustment clockwise until the fuel flow is shut off and the speed of the engine drops because of lean mixture; then open until engine runs smoothly. After engine has been put under load, readjust the main jet adjustment if necessary. Always adjust so that engine operates smoothly with as lean a mixture as possible.

Recheck the idling speed as described under "Adjusting Idle Adjusting Screw."

(For Zenith Carburetor Only)

If the engine is not getting the correct mixture of fuel, it may be that the main jet adjusting screw has loosened. If necessary, tighten adjustment screw packing nut securely.

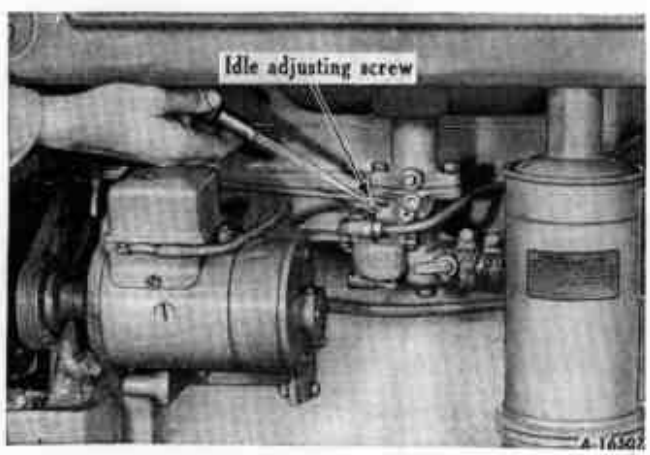
Removing the Carburetor

1. Shut off the fuel supply at the fuel tank.

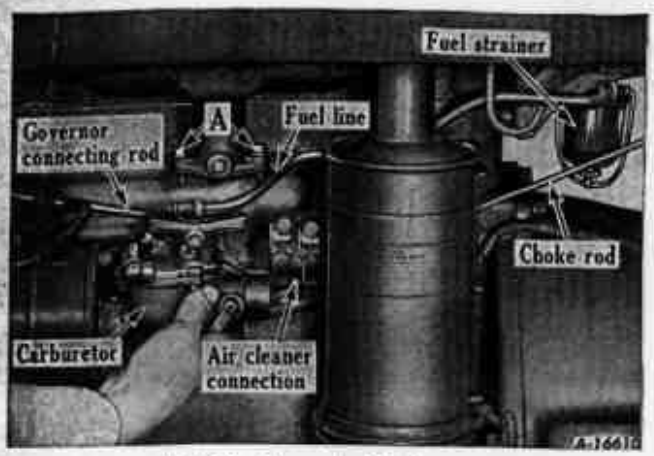
2. Drain the carburetor by removing the drain plug when operating on gasoline or by opening the drain cock when operating on distillate or kerosene. After the carburetor has drained completely, close the drain cock or replace the drain plug.

3. Disconnect the choke and governor controls.

4. Disconnect the fuel line.



Illust. 30A—Carburetor Adjustment.



Illust. 31—Removal of Carburetor.

5. Remove the air cleaner connections to the carburetor.

6. Remove the complete carburetor by removing the cap screws or nuts "A," *Illust. 31*, which fasten it to the manifold.

Installing the Carburetor

1. Install the carburetor on the engine in the reverse order of removal.

2. Turn on the gasoline supply.

3. Adjust the carburetor as described previously.

Cold Weather Precautions

When operating the tractor in temperatures of 32°F. or lower, observe the following precautions:

Fuel System

Use only a high-test winter-grade gasoline for starting, and keep your supply in a closed container so the more volatile portion does not evaporate.

Fill the fuel tank at the end of the day's run to prevent moisture from collecting in the tank.

Lubrication

Be sure to use the correct grade of lubricant in the engine crankcase, air cleaner, magneto impulse coupling, transmission, differential and steering gear case *as specified on page 27*.

Cooling System

When the temperature is likely to be 32° F. or lower, there is danger of the water freezing in the cooling system.

To prevent this, either drain the water from the cooling system at the end of each run, or use one of the recommended anti-freeze solutions.

To Drain the System

1. Remove the radiator drain plug on the lower left side of engine, *Illust. 32*.

2. See that the drain is not plugged and that the water drains completely.

Important! Before filling the radiator in freezing weather, either close the radiator shutter (if tractor is so equipped) or cover the entire radiator and start the engine; then fill it with water immediately. This prevents the water from freezing during the warming-up period. Adjust the radiator shutter to maintain the operating temperature of the engine on the high side of the "RUN" range on the heat indicator, for engines using distillate or kerosene fuels, *Illust. 6A*, or on the low side of the "RUN" range for gasoline fuel.

Magneto Impulse Coupling

For satisfactory starting, it is important to keep the magneto impulse coupling oiled liberally, *as specified on page 24*. Keep the impulse coupling free of dirt and gummy rust formation.

When hand-cranked, the impulse coupling should trip (click) twice for each revolution of engine; failure to do so may indicate need for cleaning. To clean the magneto, remove it as described *on page 37* and flush the impulse coupling and magneto drive chamber with kerosene.

Anti-freeze Solutions

The following table shows the quantity of anti-freeze to be added to the cooling system for various temperatures.

Freezing Point (Fahrenheit)	Pints of anti-freeze required		
	Ethylene Glycol	Distilled Glycerine	Denatured Alcohol
10°	6½	9	8
0°	9	10½	10
−10°	10½	12½	11½
−20°	12	14	13
−30°	13	15½	15
−40°	14	—	17
−50°	15	—	19
−60°	16½	—	20½
−70°	17	—	—

The use of alcohol as an anti-freeze is not recommended because denatured alcohol boils at 173°F. However, if it is necessary to use alcohol, check the solution frequently to make certain that you have adequate protection for the prevailing temperature.

Note: Use only one type of anti-freeze solution. Do not mix solutions as it will be difficult to determine the exact amount of protection that you have.

Never use any of the following in the cooling water as an anti-freeze:

Honey, salt, kerosene, fuel oil, glucose or sugar, calcium chloride, or any alkaline solution.

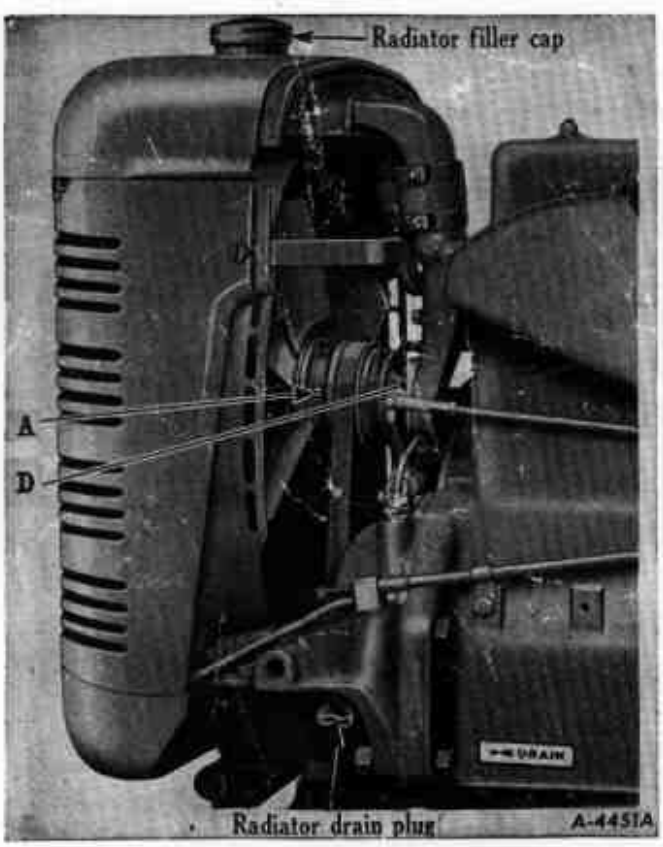
If an anti-freeze solution is to be used, observe the following instructions:

1. Inspect the hose connections. They must be in good condition inside and out. Then tighten all water connections.

2. Inspect the fan belt and adjust to proper tension as described on *page 33*. If the belt is worn or oil soaked it is best to install a new one.

3. Drain and clean out the cooling system as described on this page.

4. Make sure that the radiator drain is tightly closed. Pour the required amount of anti-freeze into the cooling system. Fill the radiator with clean water (use soft or rain water if possible) to a level slightly below bottom of filler neck. Then inspect all hose connections for leaks.



Illust. 32—Cooling System

Should the motor overheat, allow the engine to cool off before removing the cap to fill the radiator. When removing the cap, be extremely careful to avoid being scalded by steam which has built up pressure in the radiator.

Cooling System

The water is circulated through the engine block, cylinder head and radiator by thermo-syphon method. As the engine warms up, the water is heated, expands and circulates through the radiator where the water is cooled before again circulating through the engine.

To Clean Out Dirt and Sludge

1. Drain the cooling system by removing the drain plug, *Illust. 32*. Allow the system to drain and replace the plug.

2. Fill the cooling system with a solution of 2 pounds of ordinary washing soda mixed with 13 U. S. quarts of water (cooling system capacity).

3. Leave off the radiator filler cap and operate the engine until the water is hot, then drain and flush with clean water.

To Fill Cooling System

1. The water capacity is approximately 13 U. S. quarts.

2. Replace the drain plug.

3. Fill the radiator to a level slightly below the bottom of filler neck. Filling the radiator to this level will allow for expansion of the coolant under normal operating conditions.

Note: Do not pour cold water into the radiator if the engine is very hot, unless conditions make it absolutely necessary, in which case start the engine and let it idle, then slowly pour the water into the radiator.

If the engine is to be operated in freezing temperatures, refer to "Cold Weather Precautions," *page 31.*

Radiator Core

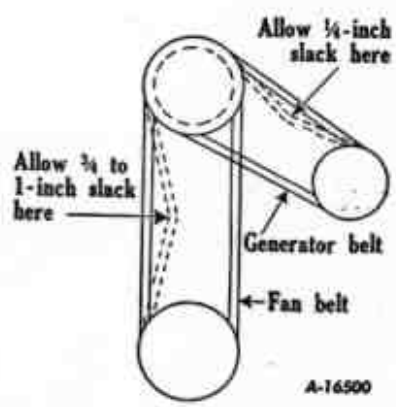
Overheating is often caused by bent or clogged radiator fins. If the spaces between the radiator fins become clogged, clean them with an air or water hose. When straightening bent fins, be careful not to injure the tubes or to break the bond between the fins and the tubes.

Fan Belt Tension

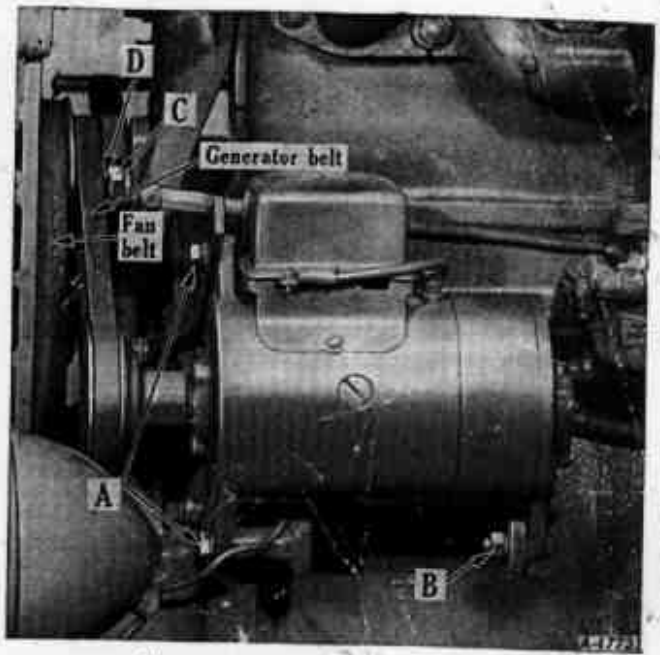
The slack of the fan belt should be checked after every 60 hours of operation to assure maintenance of the correct tension. The tension is correct when the belt can be depressed without effort by your thumb, approximately ¾ inch to 1 inch midway between the two pulleys, *Illust. 33.* If the slack is more than 1 inch, adjust the belt as follows:

Adjusting the Fan Belt

When the tractor is equipped with a generator, first loosen the bolts "A" and nut "B," *Illust. 33A,* before adjusting the fan belt tension. The tension of the fan belt can be adjusted by loosening the fan spindle "C" and moving the fan and hub assembly up or down until the correct tension is obtained. After obtaining the correct tension, tighten the fan spindle "C."



Illust. 33—Correct Belt Tension.



Illust. 33A—Fan and Generator Belts.

To adjust the generator belt refer to instructions at bottom of the page. After a new belt has been in use approximately 50 hours. check the tension and adjust again if necessary.

Removing the Fan Belt

To remove the fan belt, loosen the fan spindle "C," *Illust. 33A,* and slide the spindle to the bottom of the groove in the fan bracket. The fan belt can then be slipped over the bottom drive pulley and worked up over the fan blades.

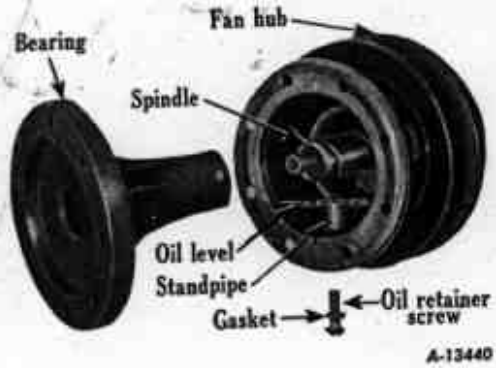
Replacing the Fan Belt

Replace the fan belt when it becomes soaked with grease, or when it is so badly worn that it does not drive the fan at the proper speed.

When replacing the belt, reverse the procedure outlined under "Removing the Fan Belt," except that the belt can be started on the lower pulley by hand. By slowly cranking the engine, the belt will find the correct position.

Adjusting the Generator Belt

After the fan belt tension has been adjusted, move the generator toward or away from the engine to get the correct generator belt tension. The tension is correct when the belt can be depressed without effort by the thumb approximately ¼ inch midway between the two pulleys, *Illust. 33.* After the proper adjustment has been made tighten bolts "A" and nut "B," *Illust. 33A.*



Illust. 34—Fan Hub Partially Disassembled Showing Oil Level.

Fan Hub Lubrication

After every 60 hours of operation or at least once every week remove oil retainer screw "A," *Illust. 32,* and turn the fan assembly so that the oil filler hole is in the left-hand horizontal position. Add engine oil until oil reaches the level of the hole. Now turn the assembly so that the hole is on the bottom and allow any excess oil to drain out. Oil is then up to level of the top of stand pipe (approximately 1/10 pint), *Illust. 34.* Replace the oil retainer screw and be sure that the retainer screw gasket is in place.

Note: The rubber gasket located behind the hub at "D," *Illust. 33A,* is used for shipping purposes only. It does not have to be replaced when worn out.

Air Cleaning System

Clean air for combustion is assured by an oil-type air cleaner. A heavy screen in the air intake cap prevents large particles from entering the air cleaner. The air then passes to the oil cup where it goes through a bath of oil. As the air rises to the intake manifold, it passes through a series of oil-bathed screens and the fine dust is removed. As the oil from the screens works back down, it carries the dirt with it and settles in the oil cup. The oil cup must be cleaned and refilled regularly with new oil.

Oil Cup Service

Remove, clean and refill the oil cup every day, or after every 10 hours of operation (more frequently when operating under dusty conditions). Refill the oil cup to the oil level bead with the same grade of oil used in the engine crankcase. The capacity of the oil cup is ¾ U. S. pint.

Do not remove the oil cup while engine is operating.

Before replacing the oil cup, clean or wipe oil or grit from top bead of oil cup, oil cup retaining clamp, and the surface under the clamp.

Air Intake Cap and Screen

The screen in the air intake cap prevents chaff and other coarse dirt from getting into the air cleaner. Keep this screen clean and free from all chaff, oil, dust, or paint, as clogged holes in the screen will reduce the power of the engine by restricting the flow of air.

Washing the Cleaner

After every 60 hours of operation—particularly if operating the tractor in an atmosphere heavily laden with dust, chaff or lint—remove the entire air cleaner from the tractor, disassemble it, *Illust. 34A,* and wash the parts thoroughly in kerosene. Be sure to clean out the air intake pipe.

After all parts have been thoroughly cleaned, replace the air cleaner body on the tractor. Make sure all joints are airtight. Replace the air intake cap. Fill the oil cup to the proper level with the specified grade of oil and replace it on the air cleaner. Be sure it is held securely in place by the cup clamp.

Illust. 34A—"Exploded" View of Air Cleaner.

To regulate the main jet adjustment, advance the engine speed control lever to the fast idle position (push forward to advance), and turn the main jet adjustment clockwise until the fuel flow is shut off and the speed of the engine drops because of the lean mixture; then open until the engine runs smoothly. After the engine has been put under load, readjust the main jet adjustment if necessary. Always adjust so that the engine operates smoothly with as lean a mixture as possible.

Recheck the idling speed as described under *"Adjusting the Idle Adjusting Screw."*

For Zenith and Carter Carburetors Only:

If the engine is not receiving the correct mixture of fuel, it may be that the main jet adjusting screw has loosened. If necessary, tighten the adjustment screw packing nut securely.

Removing the Carburetor

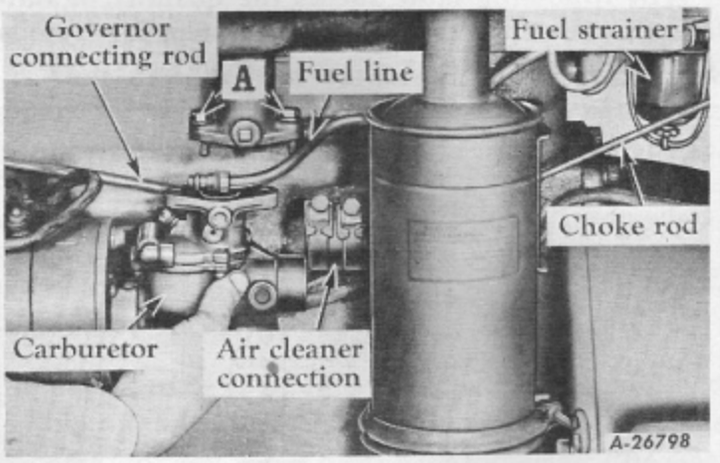
1. Shut off the fuel supply at the fuel tank.

2. Drain the carburetor by removing the drain plug when operating on gasoline, or by opening the drain cock when operating on distillate or kerosene. After the carburetor has drained completely, close the drain cock or replace the drain plug.

3. Disconnect the choke and governor controls.

4. Disconnect the fuel line.

5. Remove the air cleaner connections to the carburetor.



Illust. 35
Removal of carburetor.

6. Remove the complete carburetor by removing cap screws or nuts "A" (*Illust. 35*) which fasten it to the manifold.

Installing the Carburetor

1. Install the carburetor on the engine in the reverse order of removal.

2. Turn on the gasoline supply.

3. Adjust the carburetor as described previously.

Cold Weather Precautions

When operating the tractor in temperatures of +32°F. or lower, observe the following precautions:

Fuel System

Use only a high-test, winter-grade gasoline for starting, and keep your supply in a closed container so the more volatile portion does not evaporate.

Fill the fuel tank at the end of the day's run to prevent moisture from collecting in the tank.

Lubrication

Be sure to use lubricant of the correct viscosity in the engine crankcase, air cleaner, magneto impulse coupling, transmission, differential and steering gear housing as specified *in the "Lubrication Table."*

Magneto Impulse Coupling
(Tractors with Magneto)

For satisfactory starting, it is important to keep the magneto impulse coupling oiled liberally, as specified *on page 29.* Keep the impulse coupling free of dirt and gummy rust formation.

When the engine is hand-cranked, the impulse coupling should trip (click) twice for each revolution of the engine; failure to do so may indicate need of cleaning. To clean the magneto, remove it as described *on page 45* and flush the impulse coupling and magneto drive chamber with kerosene.

Cooling System

When the temperature is likely to be +32° F. or lower, there is danger of the water freezing in the cooling system.

To prevent this, drain the water from the cooling system at the end of each run or use one of the recommended antifreeze solutions.

Draining and Refilling the Cooling System

1. Remove the radiator drain plug on the lower left side of the engine. *See Illust. 37.*

2. See that the drain hole is not plugged and that the water drains completely. Then replace the drain plug.

Important! Before filling the radiator in freezing weather, close the radiator shutter (if the tractor is so equipped) or cover the entire radiator and start the engine; then fill it with water immediately. This prevents the water from freezing during the warming-up period. For engines using distillate or kerosene, adjust the radiator shutter to maintain the operating temperature of the engine on the high side of the "RUN" range on the heat indicator (*Illust. 6A*), or on the low side of the "RUN" range for gasoline fuel.

Antifreeze Solutions

The following table shows the quantity of antifreeze to be added to the cooling system for various temperatures:

Freezing Point (Fahrenheit)	Pints of antifreeze required		
	Ethylene Glycol	Distilled Glycerine	Denatured Alcohol
+10°	6½	9	8
0°	9	10½	10
−10°	10½	12½	11½
−20°	12	14	13
−30°	13	15½	15
−40°	14	—	17
−50°	15	—	19
−60°	16½	—	20½
−70°	17	—	—

The use of alcohol as an antifreeze is not recommended because denatured alcohol boils at +173°F. However, if it is necessary to use alcohol, check the solution frequently to make certain you have adequate protection for the prevailing temperature.

Note: Use only one type of antifreeze solution. Do not mix solutions, as it will be difficult to determine the exact amount of protection.

Never use any of the following in the cooling water as an antifreeze:

> Honey, salt, kerosene, fuel oil, glucose or sugar, calcium chloride, or any alkaline solution.

If an antifreeze solution is to be used, observe the following instructions:

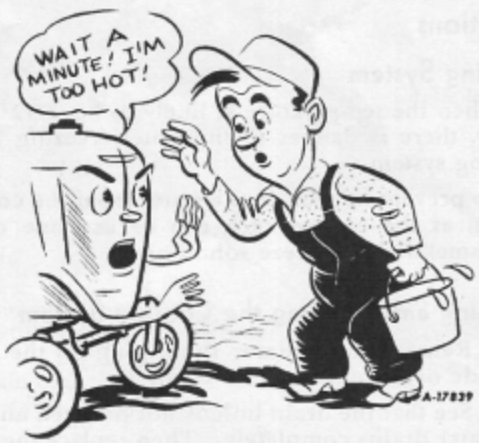
1. Inspect the hose connections. They must be in good condition inside and out. Then tighten all water connections.

2. Inspect the fan belt and adjust it to the proper tension as described *on pages 37 and 38.* If the belt is worn or oil soaked, it is best to install a new one.

3. Drain and clean the cooling system as described *on page 37.*

4. Make sure the radiator drain is tightly closed. Pour the required amount of antifreeze into the cooling system. Fill the radiator with clean water (use soft or rain water if possible) to a level slightly below the top of the filler neck. Then inspect all hose connections for leaks.

Cooling System



Should the motor overheat, allow the engine to cool off before removing the cap to fill the radiator. When removing the cap, be extremely careful to avoid being scalded by steam which has built up pressure in the radiator.

The water is circulated through the engine block, cylinder head and radiator by the thermo-syphon method. As the engine warms up, the water is heated, expands and circulates through the radiator where the water is cooled before again circulating through the engine.

Cleaning Out Dirt and Sludge

1. Drain the cooling system by removing the drain plug. *See Illust. 37.* Allow the system to drain; then replace the plug.

2. Fill the cooling system with a solution of two pounds of ordinary washing soda mixed with 13 U. S. qt. of water (cooling system capacity).

3. Leave off the radiator filler cap and operate the engine until the water is hot; then drain and flush with clean water.

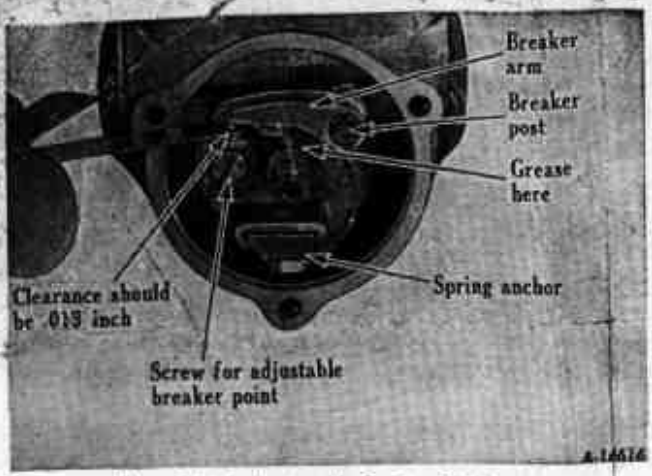
Filling the Cooling System

1. The water capacity of the cooling system is approximately 13 U. S. qt.

2. Replace the drain plug.

3. Fill the radiator to a level slightly below the top of the filler neck. Filling the radiator to this level will allow for expansion of the coolant under normal operating conditions.

Fill the radiator slowly. This permits air to escape from the cylinder head, allowing the cooling system to be filled to its maximum capacity.



Illust. 37—Adjusting the Breaker Points.

Remove the breaker arm and anchor from the chamber, and clean all parts. Inspect the breaker points and, if necessary, dress them with a sharp fine file. If the points are worn excessively, replace both points.

Fill the recess in the breaker post with grease and pack a small quantity of magneto grease in back of the breaker arm rubbing block, *Illusts. 36A and 37.* See your International Harvester dealer for the proper grease to use.

Assemble the breaker arm, leaving the spring anchor projecting 1/8 to 3/16 inch above the top of the slot so that it is pushed into place by the distributor body. Be sure the points line up when the breaker arm is pushed into place.

Check the opening between the breaker points with the gauge furnished with the tractor, *Illust. 37.* The point opening should be .013 inch when the rubbing block is on the high part of the cam. If opening is not correct, adjust it by loosening the screw holding the adjustable point, *Illust. 37,* and moving the point up or down until gauge slips snugly into opening. After the proper adjustment has been made, tighten the screw.

Line up the distributor rotor key with the keyway in the spindle, *Illust. 36A,* and press the rotor loosely on the spindle. With the engine on top dead center of the No. 1 firing stroke, turn the distributor rotor until the metal strip on rotor points to the No. 1 terminal on the distributor cap. Place the distributor body on the magneto and be sure rotor shaft enters the "D" shaped hole in magneto rotor pinion. Remove the distributor rotor to tighten the three screws *"A," Illust. 36A.* Replace the distributor rotor and distributor cap.

Greasing Rotor Bearings and Distributor Gear

After every 2,000 hours of operation or at least every two years, the magnet rotor bearings, distributor gear and distributor gear chamber should be cleaned and repacked with IH magneto grease. We recommend this be done by your International Harvester dealer's serviceman.

Distributor Cap

Every three or four months remove the distributor cap and examine the inside. If any dust, moisture or oil deposits are present, thoroughly clean and wipe dry. To assure long life of the distributor, care must be taken to keep the two small ventilator holes "A," *Illust. 36,* open at all times. Also see that the distributor rotor is kept clean.

If the distributor cap terminal nipples are removed, be sure that the terminals and coil cover terminals are clean and dry. The magneto is equipped with these nipples to prevent any external electrical leakage when the tractor is operating under adverse conditions.

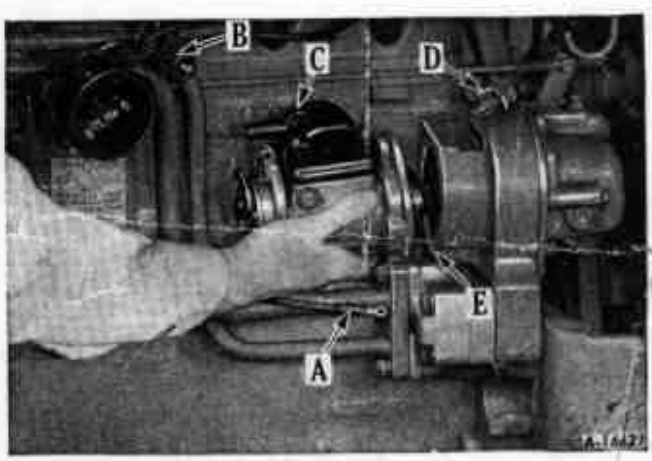
Removing the Magneto

If it is necessary to remove the magneto for any reason, proceed as follows:

1. Disconnect the ignition switch cable "A," *Illust. 37A,* by removing the fillister head screw and lock washer, attaching the cable to the magneto terminal.

2. Pull out cable "B" from the coil cover "C" and remove the distributor cap.

3. Remove the cap screw and mounting clip "D," and the cap screw from hole "E." The magneto assembly can then be removed, *Illust. 37A.*



Illust. 37A—Removal of the Magneto.

Installing and Timing the Magneto to the Engine

1. Pull out cable B, *Illusts. 36 and 37A,* from the coil cover end. This will eliminate any possibility of accidental starting.

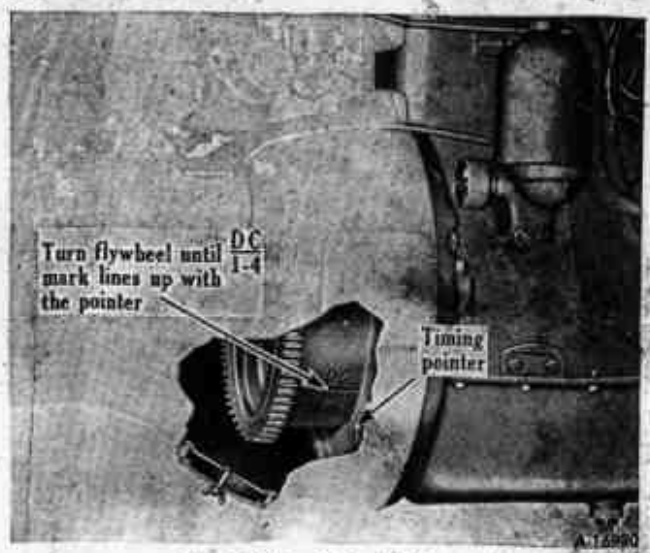
2. Crank the engine until the No. 1 piston (the piston next to the radiator) is on the upper dead center of the compression stroke. The compression stroke can be determined by removing the No. 1 spark plug, placing your thumb over the opening, and cranking the engine until an outward pressure is felt. Continue cranking slowly until the DC/1-4 mark on the flywheel is in line with the pointer on the clutch housing cover. Both intake and exhaust valves will now be closed. (Timing pointer can be seen through opening in bottom of clutch housing, *Illust. 38A.*)

3. Remove the distributor cap and turn the magneto coupling in a counterclockwise direction (as viewed from the coupling end) until the metal strip on the distributor rotor points toward the No. 1 terminal on the distributor cap. Replace the distributor cap.

4. Assemble the magneto onto the engine, making sure that the lugs on the impulse coupling engage in slots on the magneto drive coupling. (Assemble the magneto so that the top is as close to the crankcase as possible.)

5. Insert the magneto mounting cap screw through the magneto flange and into hole "E," *Illust. 37A.* Screw the cap screw in just enough to hold the magneto in place. Crank the engine one complete revolution to the next top dead center. Pull the upper part of the magneto away from the engine until the impulse coupling just trips.

6. Fasten the upper part of the magneto to the flange with the mounting clip and cap screw "D" and tighten both cap screws securely. Attach the spark plug cables to the engine and magneto. Start by connecting the No. 1 cylinder spark plug to socket marked "1" on distributor block; connect No. 3 socket with No. 3 cylinder; next with No. 4 cylinder; next with No. 2 cylinder. (*See Wiring Chart, Illusts. 35 and 36.*)



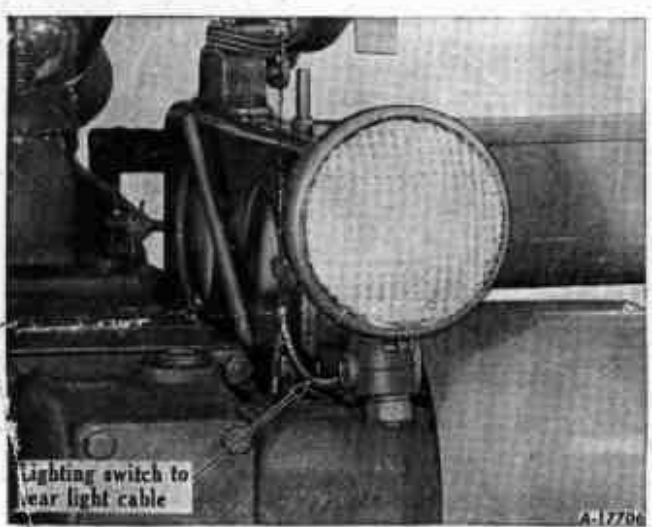
Illust. 38A—Timing Pointer.

7. Connect the switch cable to the magneto terminal.

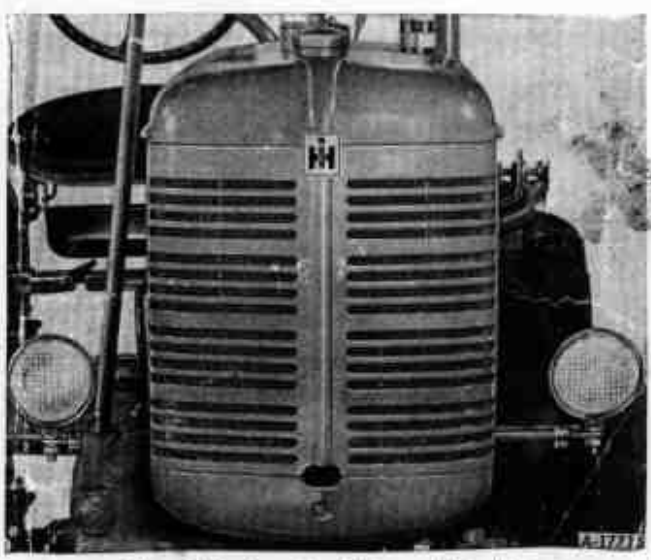
8. To check the timing, crank the engine slowly until top dead center of the No. 1 cylinder is reached, at which time the impulse coupling should just trip.

9. The magneto is now correctly wired and timed.

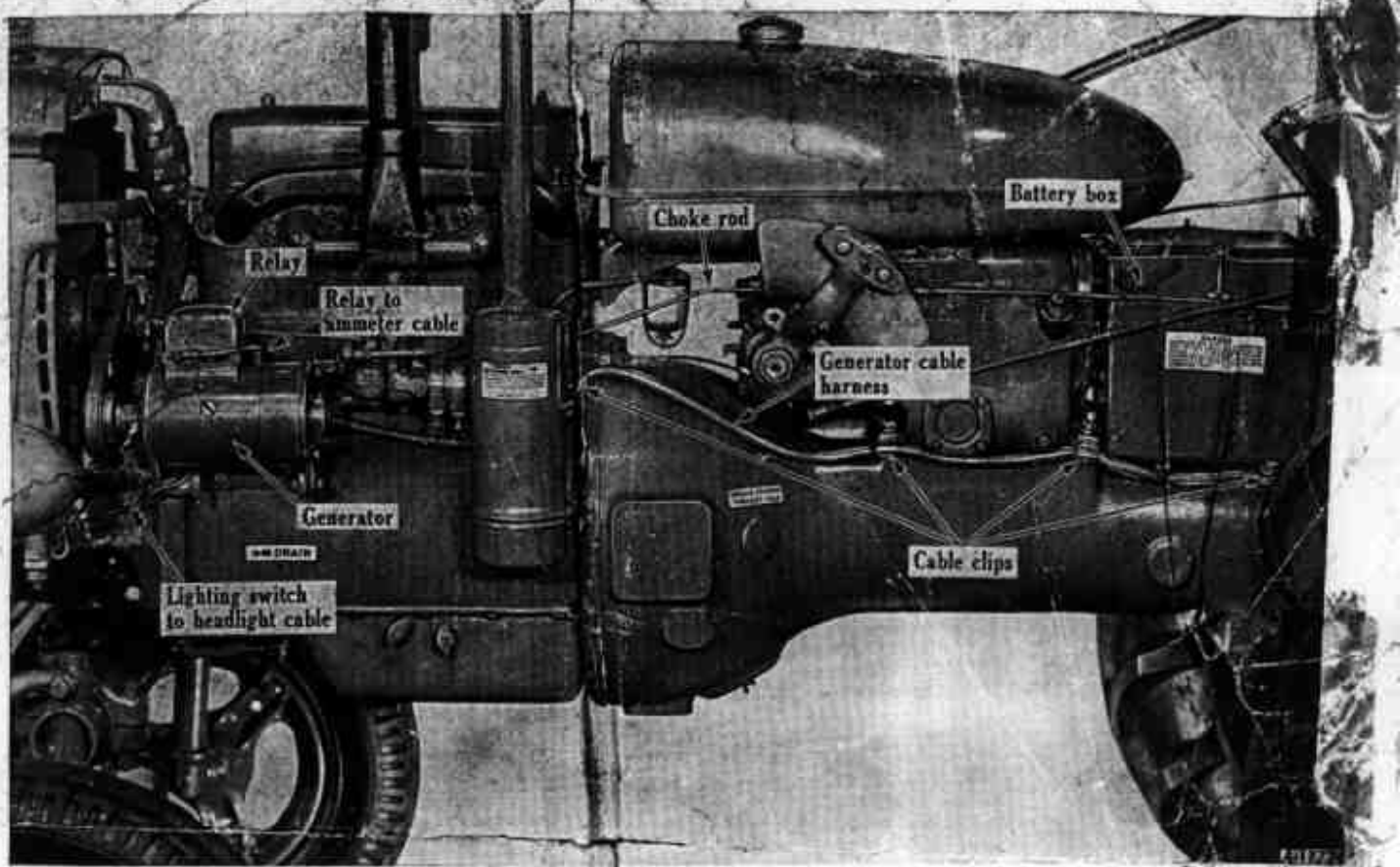
10. Push cable "B" back into the socket in the coil cover, *Illust. 36.*



Illust. 38—Rear Light and Bracket.



Illust. 38B—Front Headlights and Brackets.



Illust. 39—Generator and Cables.

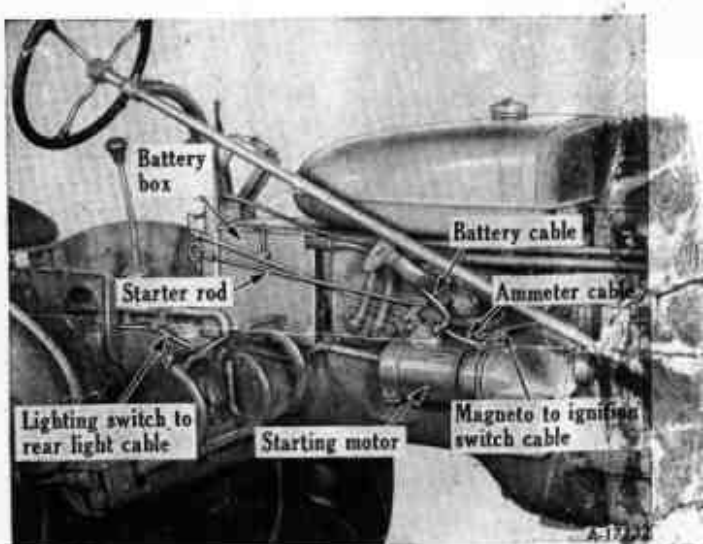
Starting and Lighting Equipment

Description

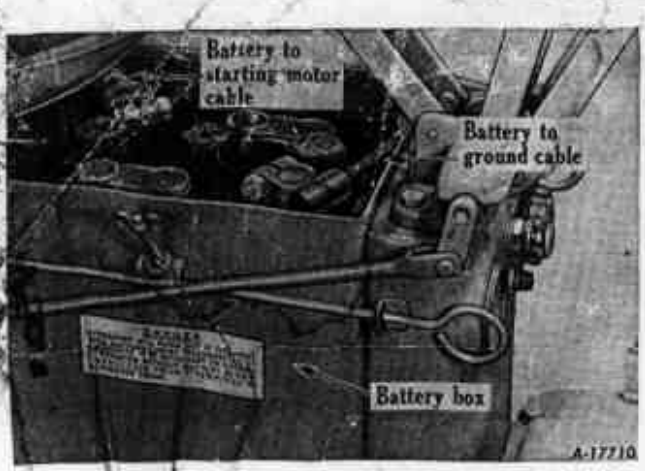
The electrical system of the tractor is a 6-volt type and consists of a generator, generator cutout relay, starting motor, lights, light switch and a 6-volt battery. The system is a single-wire type with a ground return to the battery.

Use the illustrations on *pages 39 and 40,* also the wiring diagram on *page 44,* as a guide for identifying the various electrical units and for tracing the electrical cables and connections. Be sure all terminals are clean and securely fastened.

When the electrical equipment is installed at the factory, the tractor is shipped with the battery ground cable disconnected, *Illust. 40,* and, in addition, the wire leading to the "F" terminal on the generator is not connected, *Illust. 44.* Therefore, before starting the tractor, be sure the battery ground cable and the generator wire are connected to their correct terminals.



Illust. 39A—Starting Motor, Cables, etc.

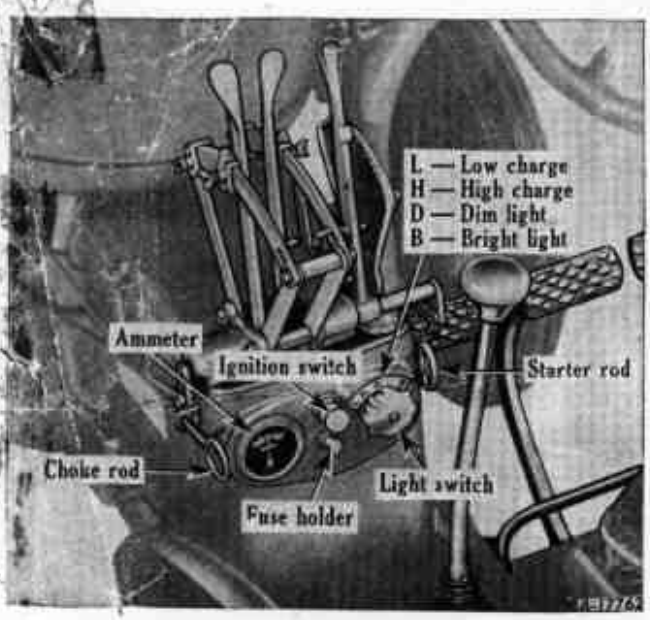


Illust. 40—Battery and Cables.

Before working on any part of the electrical system, disconnect the battery ground cable, Illust. 40. Do not reconnect this cable until all electrical work has been completed. This will prevent shorting and causing damage to any of the electrical units.

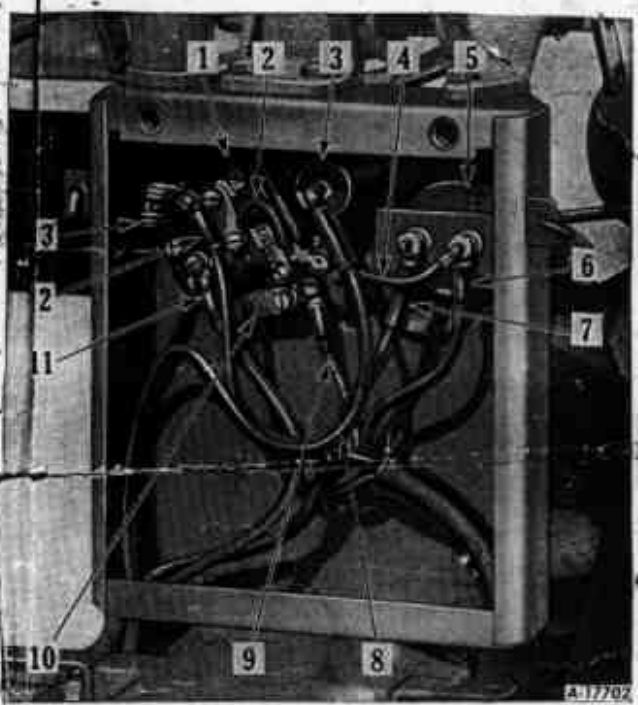
ght and Charging Rate Switch

The light switch not only operates the lights but it also is used to manually control the generator output. This switch, *Illust. 40A,* can be operated from the operator's seat. The switch has four positions, Low Charge, High Charge, Dim and Bright.



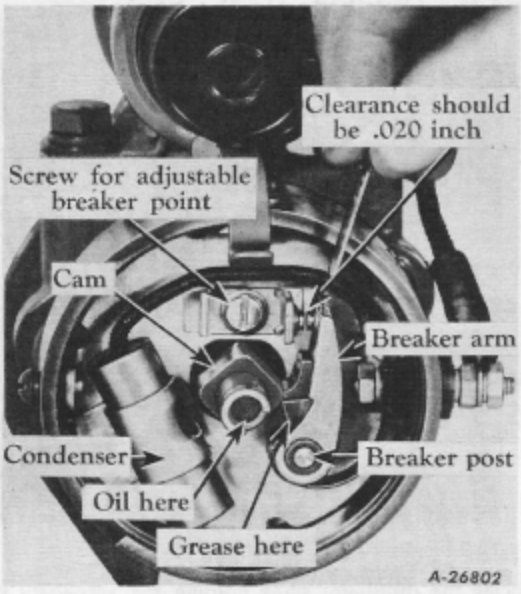
Illust. 40A—Light Switch, Ammeter, etc.

When the switch is in Dim, Bright or High Charge position the field circuit is direct to the ground, giving the maximum generator output for the third brush setting. During the daytime, when the lights are not used, the switch should be placed in the Low Charge position. This adds a resistance coil to the field circuit and reduces the output of the generator to approximately one-half of its original charge rate. If the charge in the battery is low, place the switch in High Charge position until the battery is fully charged.



Illust. 40B—Back of Instrument Panel Showing Light Switch, Ammeter, Cables, etc.

Ref. No.	Description
1.	Light switch.
2.	Fuse housing to switch cable.
3.	Ignition switch.
4.	Fuse housing to ammeter cable.
5.	Ammeter.
6.	Generator to ammeter cable (natural with black and red cross tracers).
7.	Ammeter to starting motor cable.
8.	Magneto to ignition switch cable.
9.	Generator field to switch cable (natural with black tracer).
10.	Field resistance coil.
11.	Switch to rear light cable.
12.	Switch to headlight cable.
13.	Dimmer resistance coil.



Illust. 41
Adjusting the breaker points.

Check the condition of the breaker points for build-up or lip formation. If present, the points must be dressed before the point opening can be checked or set. Check the opening between the breaker points with a feeler gauge as shown *in Illust. 41.* The point opening should be .020 inch when the rubbing block is on the high part of the cam. If the opening is not correct, adjust it by loosening the screw holding the adjustable point. Then move the point toward or away from the point on the breaker arm until the gauge slips snugly into the opening. After the adjustment has been made, tighten the screw.

Distributor Cap

Every three or four months remove the distributor cap and examine the inside. If any dust, moisture or oil deposits are present, thoroughly clean and wipe dry. To assure long life of the distributor, care must be taken to keep the three small ventilator holes in the distributor cap open at all times. Also see that the distributor rotor is kept clean.

If the terminal nipples are removed, be sure the distributor cap terminals and coil terminal are clean and dry. The distributor is equipped with these nipples to prevent any external electrical leakage when the tractor is operating under adverse conditions.

Ignition Coil

The ignition coil does not require special service other than to keep all terminals and connections clean and tight.

Removing the Battery Ignition Unit

If it is necessary to remove the battery ignition unit for any reason, proceed as follows:

1. Disconnect ignition switch cable "C" (*Illust. 42A*) from the ignition coil.

2. Pull secondary cable "A" (*Illust. 42B*) out of the center socket on the distributor cap and remove the cap.

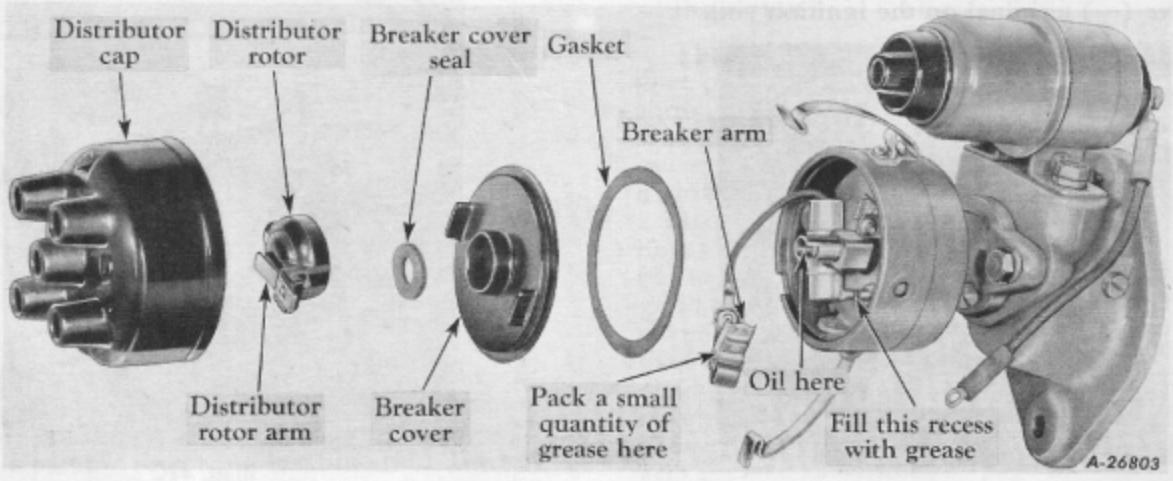
3. Crank the engine slowly until the distributor rotor arm is in the No. 1 firing position. *See Illust. 42A.*

4. Remove the two cap screws and the mounting clip from the distributor drive housing flange and remove the complete unit.

Installing the Battery Ignition Unit

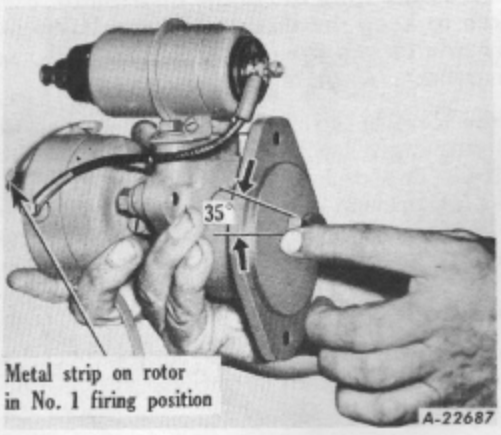
Note: If the gears on the drive shaft have not been disengaged or rotated at any time after the complete unit has been removed, disregard Steps 1 and 2 outlined below. Also it should not be necessary to retime the distributor to the engine.

Continued on next page.



Illust. 41A
Distributor partially disassembled for servicing.

Installing the Battery Ignition Unit—Continued



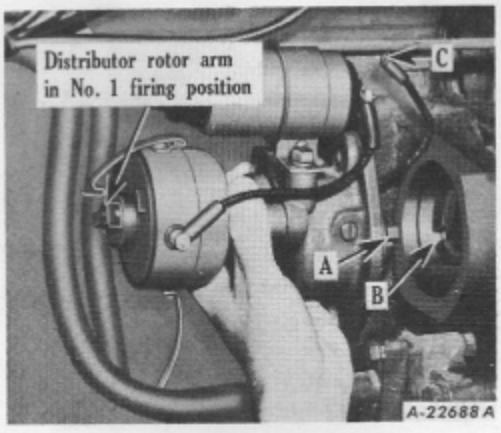
Illust. 42
Adjusting the distributor rotor and drive shaft lugs for timing the distributor.

1. Place the battery ignition unit in one hand and, with the fingers of the other hand, turn the drive lugs in a clockwise direction until the rotor arm is approximately in the No. 1 firing position. *See Illust. 42.* Then continue to turn slowly and lightly until a slight resistance is felt.

2. Pull out the drive shaft to disengage the gears; then turn the shaft so drive shaft lugs "A" are approximately 35° past horizontal or approximately in the same position as drive shaft slots "B". *See Illust. 42A.* Engage the gears and press the drive shaft in with the palm of the hand.

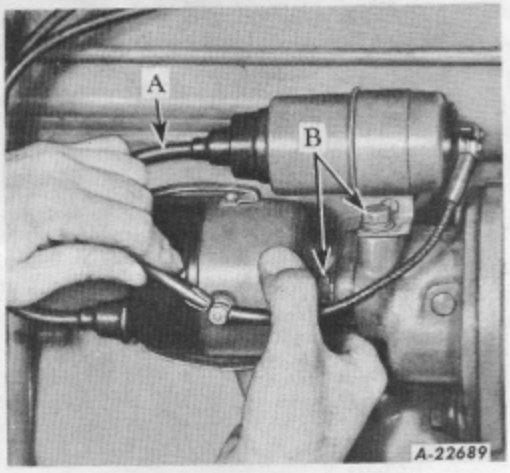
3. Assemble the battery ignition unit and gasket and fasten with the mounting bolts and washers, using the mounting clip in front of the lock washer on the top bolt. Assemble the distributor cap.

4. Connect switch cable "C" (*Illust. 42A*) to the negative (—) terminal on the ignition coil.



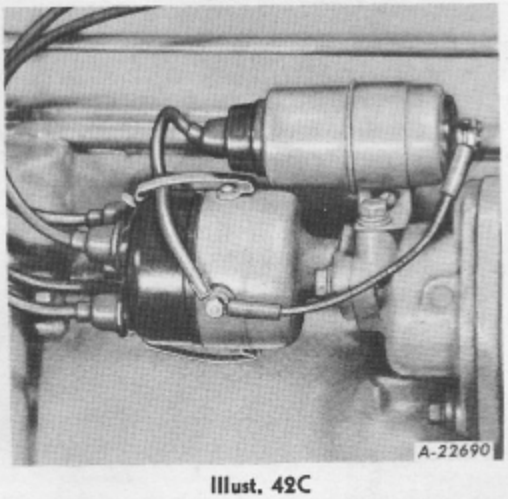
Illust. 42A
Assembling the battery ignition unit.

Timing the Distributor to the Engine



Illust. 42B
Advancing the distributor while holding the secondary cable 1/16 to 1/8 inch from the primary terminal.

Loosen distributor mounting bolts "B". *See Illust. 42B.* Set the engine on the top dead center of the No. 1 firing stroke. The secondary cable should be assembled properly in the coil terminal. Pull out the ignition switch button and note if the ammeter shows discharge. If the ammeter shows discharge, the points are closed and the retarding of the distributor is not necessary. If the ammeter does not show discharge, retard the distributor by turning the body about 30° in the same direction as the cam rotation. Pull secondary cable "A" (*Illust. 42B*) out of the center socket on the distributor cap and hold the free end of the cable within 1/16 to 1/8 inch from the distributor primary terminal as shown *in Illust. 42B.* Advance the distributor by turning the distributor body slowly in a direction opposite to the cam rotation until a spark occurs.



Illust. 42C
Showing the secondary cable held under the distributor cap spring for final check of timing.

Storage Battery

Electrical energy is stored in the battery through chemical action, to be used for starting the engine and for furnishing electric lighting. It is not the source of electricity but only a storage reservoir for use when the generator is not running. In starting for instance, the battery supplies the energy but as soon as the engine starts, the generator begins to replace the electricity taken from the battery.

You will receive the maximum of satisfactory service from your battery by closely adhering to the following simple precautions and service operations.

A registration card is furnished with the battery. The purchaser of a new battery should take the card to the nearest authorized battery service station for registration.

Complete instructions for dry batteries (used for export) are included with battery.

Cleaning and Servicing the Battery—Battery cable terminals must be kept clean and tight. Use hot water for cleaning the top of the battery. Brighten terminal contact surface with wire wool, and re-assemble. Be sure terminals are clamped tightly and that battery is fastened securely in the battery box. Replace unserviceable cables. Keep the vent holes in the battery filler caps open.

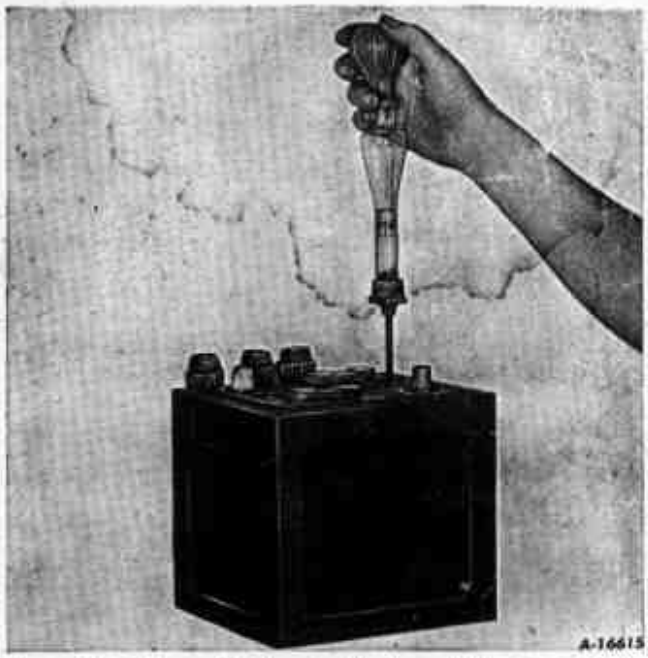
Liquid Level—The electrolyte (acid and water) in each cell should be 3/8 inch above the separators at all times to prevent battery failure. When the electrolyte is below this level, pure distillated water should be added. If your battery is equipped with automatic liquid leveling devices follow the directions furnished with the battery or consult your International Harvester dealer. Never use hydrant water or any water which has been in a metal container. Keep pure distilled water in a glass jar on hand for battery use only. Use a clean syringe when adding water and be careful not to allow dirt or corrosion salts to enter the cells.

Acid or electrolyte should never be added except by a skilled batteryman. Under no circumstances add any special battery "dopes," solutions or powders.

Caution: Do not lay any tools across the battery terminals as it may result in a flash or short circuit. Be careful to avoid spilling any electrolyte on the hands or clothing.

The specific gravity of the electrolyte indicates the relative condition of the battery charge and warns when it may be necessary to increase the generator charging rate, or recharge the battery.

Inspect the battery once every two weeks to maintain the correct specific gravity. The specific



Illust. 43—Taking a Hydrometer Reading of Electrolyte in the Battery.

gravity of a fully charged battery is 1.275 to 1.300 corrected to 80° F. (liquid temperature). A specific gravity reading of at least 1.250 corrected to 80° F. should be maintained. Never allow the battery to fall below 1.225, which indicates half discharged.

The specific gravity reading will vary with the temperature of the liquid. For instance, a fully charged battery showing a reading of 1.280 at 80° F. will show 1.268 when electrolyte temperature is 110° F. and 1.312 when electrolyte temperature is 0° F.

Use an accurate hydrometer when testing for specific gravity. Readings should not be taken immediately after adding water.

All cells should show approximately the same specific gravity reading. Wide variations indicate something is wrong.

See your International Harvester dealer or authorized battery service station.

Battery Voltage—With the battery fully charged and on charge at the normal rate, the average cell voltage at 80° F. ranges between 2.5 and 2.7 volts; at 100° F. between 2.4 and 2.6 volts.

Cold Weather Operation—It is especially important to keep the battery close to full charge for cold weather operation. Add water to the battery in freezing temperatures only when the tractor is to operate for several hours, to thoroughly mix the water and the electrolyte, or damage to the battery will result caused by the water freezing.

The electrolyte of a battery in various stages of charge will start to freeze at temperatures indicated below:

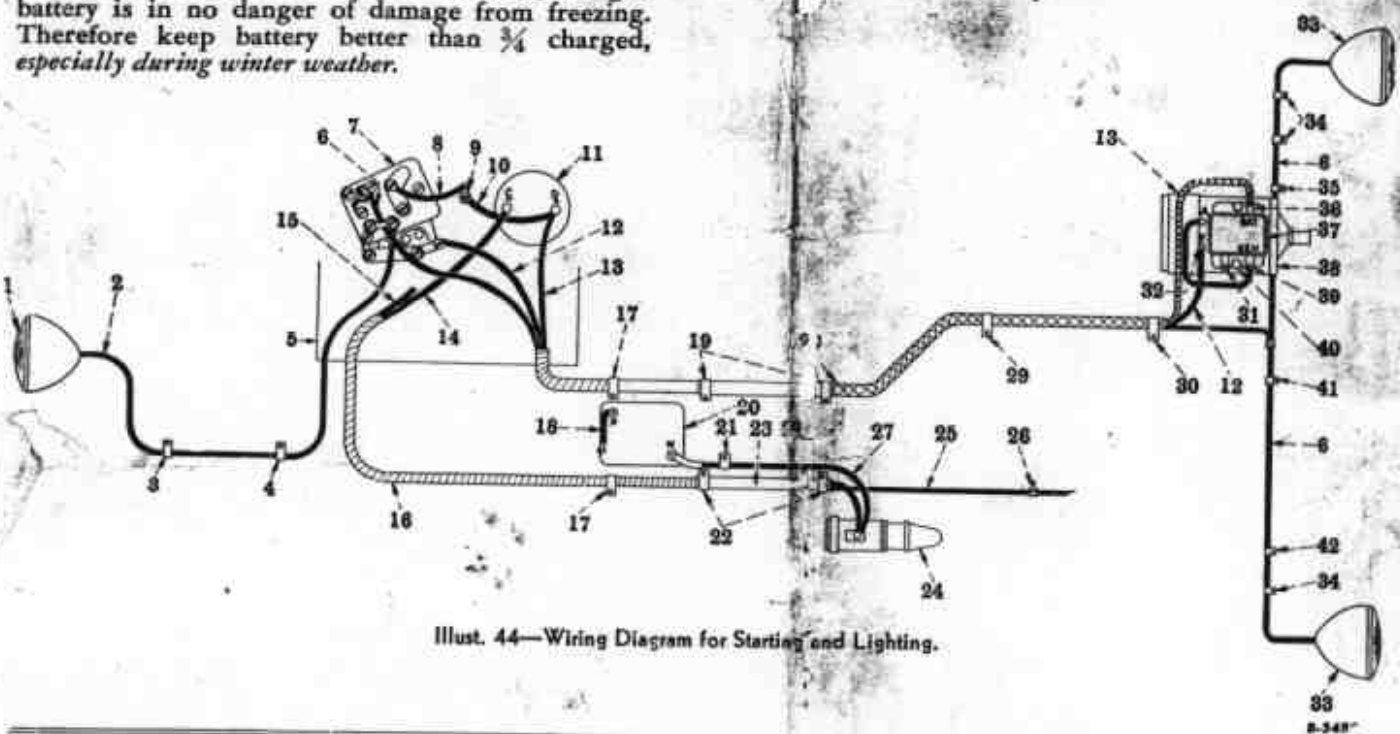
Specific Gravity (Corrected to 80° F.)	Freezing Temperature Degrees Fahrenheit
1.250—¾ charge	62° F. Below zero
1.200	16° F. Below zero
1.150	5° F. Above zero
1.100	19° F. Above zero

The above temperatures indicate the approximate points at which the first ice crystals begin to appear in the solution. The solution does not freeze solid until a lower temperature is reached. A ¾ charged battery is in no danger of damage from freezing. Therefore keep battery better than ¾ charged, *especially during winter weather.*

If your tractor is not to be operated for any length of time during the winter months, it is advisable to remove the battery and store it in a cool dry place above freezing (32° F.)

Place the battery on a rack or bench.

Check the battery at least once a month for water level and specific gravity. If battery shows need of charging it should be given immediate attention. Keeping the battery fully charged not only adds to its life but makes it available for instant use when needed.



Illust. 44—Wiring Diagram for Starting and Lighting.

Ref.	Description
1.	Rear light.
2.	Cable—lighting switch to rear light.
3.	Clip—on rear light racket bolt, lower.
4.	Clip—on starting crank mounting bracket, front.
5.	Instrument panel.
6.	Cable—lighting switch to headlight (black).
7.	Lighting switch.
8.	Cable—fuse housing to switch.
9.	Fuse housing.
10.	Cable—fuse housing to ammeter.
11.	Ammeter.
12.	Cable—generator field to lighting switch (natural with black tracer).
13.	Cable—relay to ammeter (natural with black and red crossed tracers).
14.	Cable—ammeter to starting motor.
15.	Cable—magneto to ignition switch.
16.	Cable assembly—ignition and lighting.
17.	Clips—on battery box rear hold-down bolts.
18.	Cable—battery to ground.
19.	Clips—on left-hand Touch-Control cylinder block bolts or on top left-hand side of clutch housing without Touch-Control.
20.	Battery.
21.	Clip—on fuel tank rear mounting bolt.
22.	Clips—on right-hand Touch-Control cylinder block bolts or on top right-hand side of clutch housing without Touch-Control.
23.	Cable shield.
24.	Starting motor.
25.	Cable—to magneto.
26.	Clip—on clutch housing bolt.
27.	Cable—battery to starting motor.
28.	Cable harness complete.
29.	Clip—on air cleaner support bracket bolt, lower.
30.	Clip—on generator bracket rear bolt.
31.	"F" terminal on relay.
32.	"F" terminal on frame.
33.	Headlight.
34.	Cable clamp—on light post.
35.	Clip—on generator mounting bolt, front.
36.	Battery terminal.
37.	Relay.
38.	Generator.
39.	Generator terminal.
40.	Mounting screw.
41.	Clip—on generator brace bolt, right-hand side.
42.	Clip—on crankcase front cover bolt (first below governor housing).

Valve Clearance Adjustment

Check the valve clearance after every 400 hours of operation and adjust the clearance, if necessary. A clearance of .014 inch, measured when valves are closed and engine is warm, is necessary between the end of valve levers and valve stems.

To Adjust Clearance

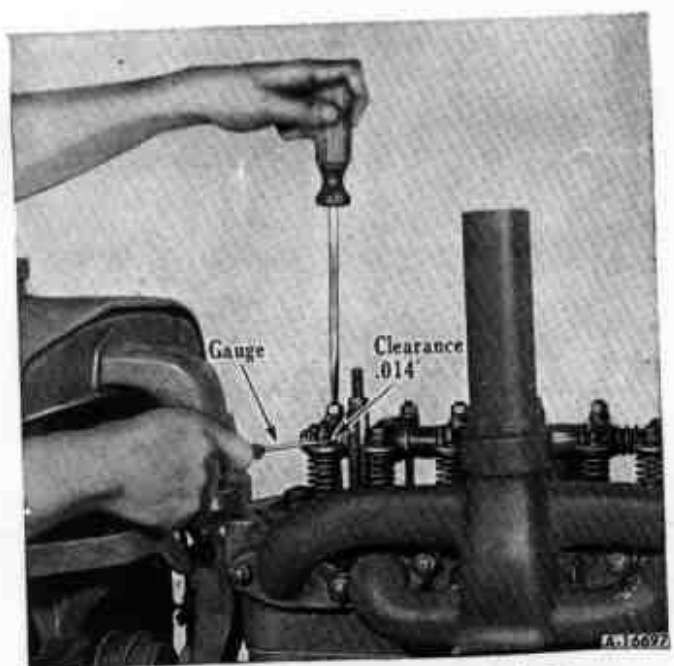
1. Before checking valve clearance, "cut out" the magneto by pulling cable "B," *Illust. 36,* out of the socket. This will safeguard against accidentally starting the engine.

2. Remove the valve housing.

3. Remove the spark plug from the No. 1 cylinder (the cylinder next to the radiator).

Place your thumb over the spark plug opening and slowly crank the engine until an outward pressure can be felt. (Pressure indicates No. 1 piston is moving toward upper dead center of the compression stroke.)

Continue cranking slowly until the DC/1-4 mark on the flywheel is in line with the pointer on the clutch housing cover. (The timing pointer can be seen by removing the clutch housing handhole cover, *Illusts. 38A and 47.*) Both valves are now closed on compression stroke of No. 1 cylinder.



Illust. 45—Gauging Valve Levers with a Feeler Gauge.

4. Loosen the lock nut and adjust the screw in the valve lever so that the gauge slips snugly between the end of the valve lever and the valve stem, *Illust. 45.*

5. Tighten lock nut and recheck the clearance.

6. Crank the engine one-half revolution at a time and check clearance of each cylinder's valves and adjust if necessary. Do this on each set of cylinder valves in succession according to the firing order of the engine, which is 1, 3, 4, 2.

7. Replace the valve housing. Check to see that the valve housing gasket makes an oiltight seal with the cylinder head. Use a new gasket if necessary.

8. Replace the magneto cable "B," *Illust. 36,* into socket from which it was removed.

Important! Be accurate—use a feeler gauge for checking the valve clearance.

Minor Engine Service Operations

Cylinder Head Gasket

For most satisfactory results in tightening cylinder head after installing cylinder head gasket, tighten down all nuts fairly snug, starting with the row in the center, then going to the others. Retighten in the same order, giving each nut a small part of a turn at a time. Continue this until all nuts are tight. Do not screw one nut down perfectly tight and then go to the next, as you will not obtain an even pressure on the gasket in this manner.

After replacing cylinder head, it is necessary to insure against leaks by retightening the stud nuts after engine has been operating and water jacket has become thoroughly heated. To properly tighten nuts the valve rocker shaft assembly must be raised.

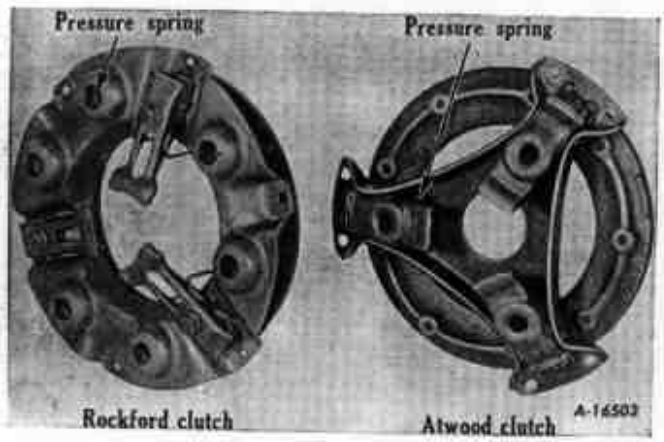
Caution! Be sure to adjust valve tappet clearance after the last tightening of cylinder head stud nuts (*see "Valve Clearance Adjustment"*).

Crankshaft Bearings, Pistons, and Rings

We cannot impress too strongly the necessity of having your International Harvester dealer's serviceman do the work on replacement of connecting-rod bearings, crankshaft bearings, pistons and rings, and grinding valves.

Engine Clutch

This engine is equipped with either a "Rockford" or "Atwood" clutch; both clutches are of the spring-loaded type, with 9-inch single plate, and dry disc. You can identify which type is in your tractor by counting the number of pressure springs. The "Rockford" clutch has 6 pressure springs while the "Atwood" has 3 springs. *Refer to Illust. 46.*



Illust. 46—Types of Clutches.

Care of the Engine Clutch

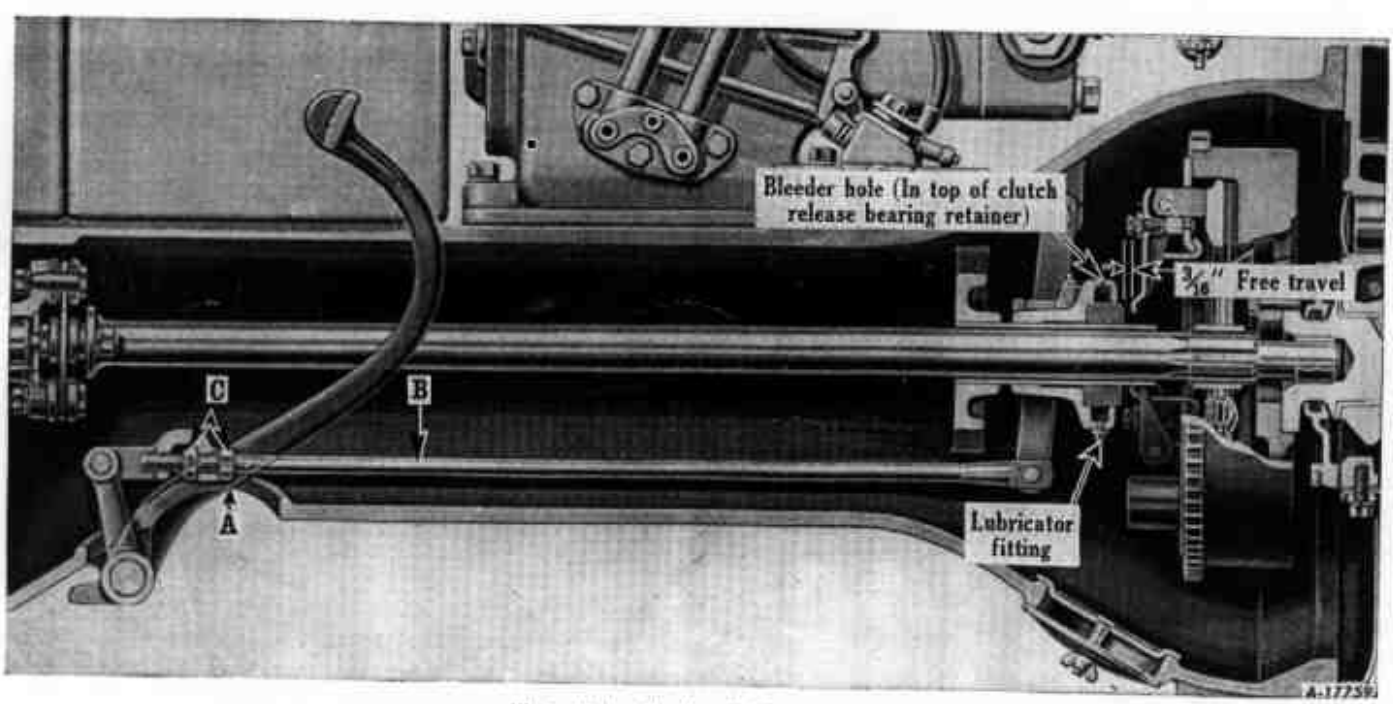
The clutch is so designed that it requires a minimum of attention. Lubricate the clutch release bearing retainer after every 120 hours of operation and the clutch release bearing after every 1,000 hours of operation or at least once a year as instructed in the "Lubrication Guide" on *pages 24 and 26.*

Do not overlubricate.

Clutch Clearance

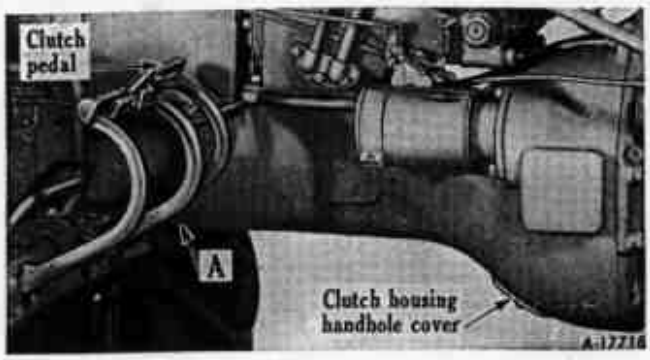
It is very important that a clearance of 3/16 inch be maintained between the clutch release bearing and the clutch release levers. In order to maintain this clearance, the clutch pedal should have a free movement of 1 to 1¼ inches when the clutch is fully engaged, *Illusts. 46A and 47A.* As the clutch wears, this free movement decreases and adjustment should be made. The clutch may be badly damaged unless a free movement of foot pedal is maintained.

The correct free movement can easily be maintained by adjusting the length of the clutch operating rod "B," *Illust. 46A.* To adjust the length of the rod,

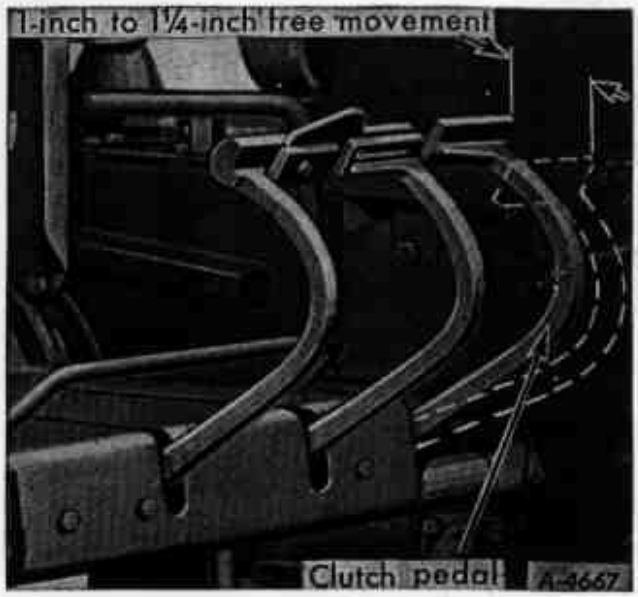


Illust. 46A—Clutch and Connections.

loosen and turn the nuts "C" on the rear end of the clutch operating rod until the correct free movement is obtained; then tighten the nuts. The nuts on the clutch operating rod can be reached through a hole in the bottom of the rear clutch housing tube at "A," *Illusts. 46A and 47.*



Illust. 47—Clutch Housing.



Illust. 47A—Clutch Pedal Free Movement.

Brakes

The brakes consist of external bands that contract on the brake drums. The brakes are controlled by foot pedals which can be operated individually or simultaneously when locked together.

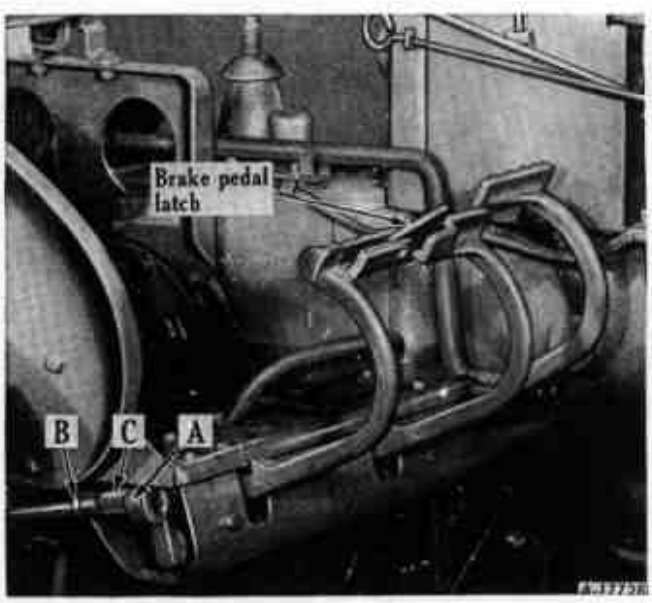
Caution: *Always lock the brake pedals together when traveling in high gear.*

Adjustment

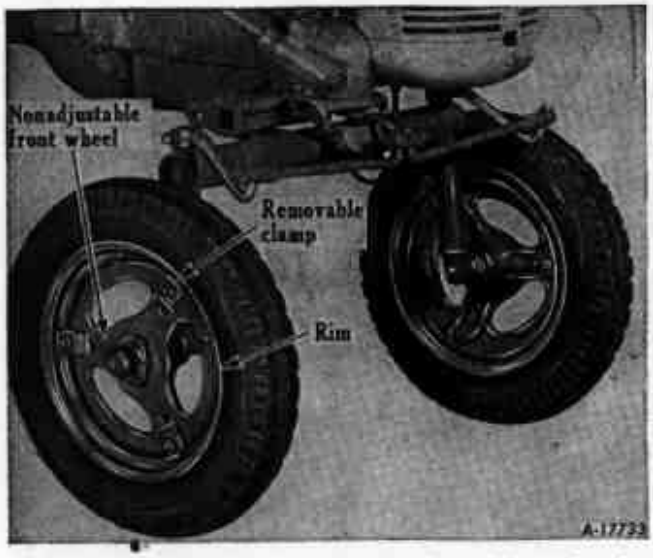
To adjust the brakes, jack up the rear end of the tractor. Remove pin "A" and loosen lock nut "B," Illust. 47A. Turn the adjusting yoke "C" until each wheel drags slightly when turned.

Replace pin "A" and tighten lock nut "B" after adjustment has been completed.

To obtain equalization of both brakes it is very important that both brake pedals have the same amount of free movement. A definite way to check the equalization of brakes is to jack up both rear wheels so they will turn freely, block tractor securely and latch the brake pedals together, then start the engine. Shift the gears to either third or fourth speed; engage the clutch; while the wheels are turning apply the brakes. Application of the brakes should slow down both wheels at the same time and also tend to reduce the speed of the engine. If one wheel stops and the other one continues to revolve, when brakes are applied, loosen the adjustment on the wheel that stops just enough so that both wheels stop simultaneously when the brakes are applied.



Illust. 47B—Brake Pedals.



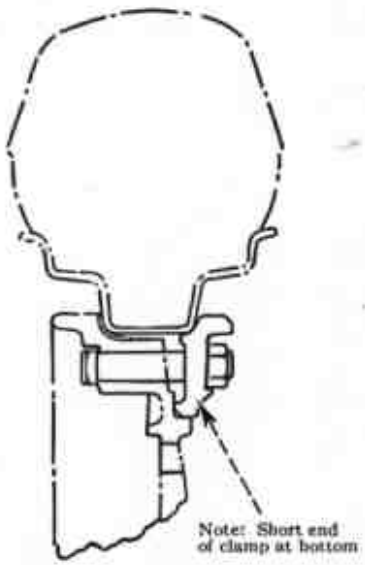
Illust. 48—Nonadjustable Front Wheel for Farmall Super-A only.

Front Wheels

Nonadjustable Type (Farmall Super-A Only)

These wheels, regularly furnished with the Farmall Super-A tractor, have demountable steel rims for 4.00-15 or 5.00-15, 4-ply tractor-type pneumatic tires. The rims are held in place by removable clamps, and the wheels revolve on tapered roller bearings.

To lubricate the front wheels refer to *page 26.*



Illust. 48A—Method of Assembling Front Wheel Rim Clamps.

When assembling the front wheel rim, be sure to assemble the clamp in the correct position as shown in *Illust. 48A.* Tighten the clamp bolts securely and equally to prevent misalignment of the rim on the wheel.

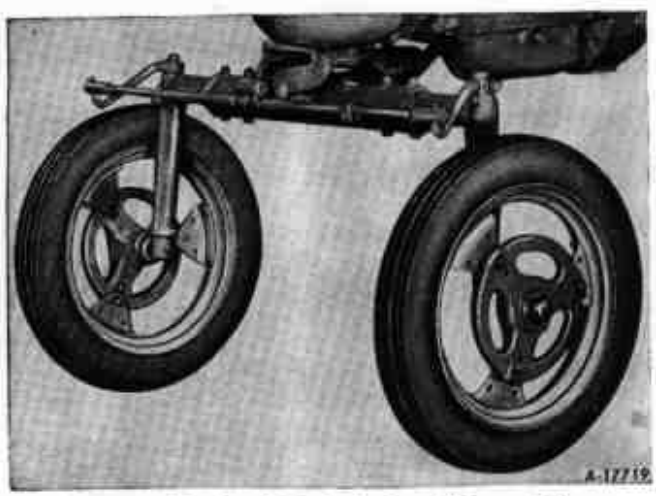
Adjustable Type (Farmall Super-A Only)

An adjustable-type front wheel is available for use with the adjustable front axle.

These wheels have rims with attached clamps, for 4.00-15 or 5.00-15, 4-ply tractor-type pneumatic tires. The rims can be mounted on the wheels with the clamps turned in or out and can be mounted on either side of the wheel to increase or decrease the front wheel tread, giving various additional tread widths when used with the adjustable front axle.

Adjustable Front Wheel (Farmall Super-AV Only)

The Farmall Super-AV front wheels revolve on tapered roller bearings, and have demountable steel rims for 4.00-19, 4-ply tractor-type pneumatic tires. The rims have attached clamps which are used to fasten the rim to the wheel. The rims can be reversed on the wheels to obtain the maximum front wheel tread position, *Illust. 50.*



Illust. 48B—Front Wheels for Farmall Super-AV.

Adjustable Front Axle

(Farmall Super-A Only)

When the Farmall Super-A is equipped with an adjustable front axle having regular nonadjustable type front wheels with 4.00-15 or 5.00-15 tires, the wheels can be set at treads of 44, 48, 52, 56, 60, 62 and 64 inches to track with respective rear wheel tread positions. *See instructions for adjusting tread widths, also Illust. 50A.*

If the Farmall Super-A is equipped with an adjustable front axle having adjustable front wheels with 4.00-15 or 5.00-15 tires the following additional treads can be obtained: 40¾, 68, 70 inches, and various other intermediate combinations. (The 40¾-inch tread position cannot be obtained on Farmall Super-A tractors equipped with 5.00-15-inch tires.)

When the Farmall Super-A is equipped with 7.50-16 front tires the rim lugs are fastened to the outside of the wheels with the rims turned out. Tread positions of 48½, 52½, 56½, 60½, 64½, 66½ and 68½ inches can be obtained by adjusting the tread widths as described in the following paragraphs.

To Adjust the Tread Widths (Super-A Only)

1. Raise the front end of the tractor.

2. Loosen the bolts holding the axle extension clamps "A."

3. Pull out the cotter pins and remove the axle extension clamp pins "B." Remove the bolts from the tie rod clamps "C."

4. Pull the axle extensions out an equal distance on both sides to the desired tread position and move the tie rods "D" to correspond.

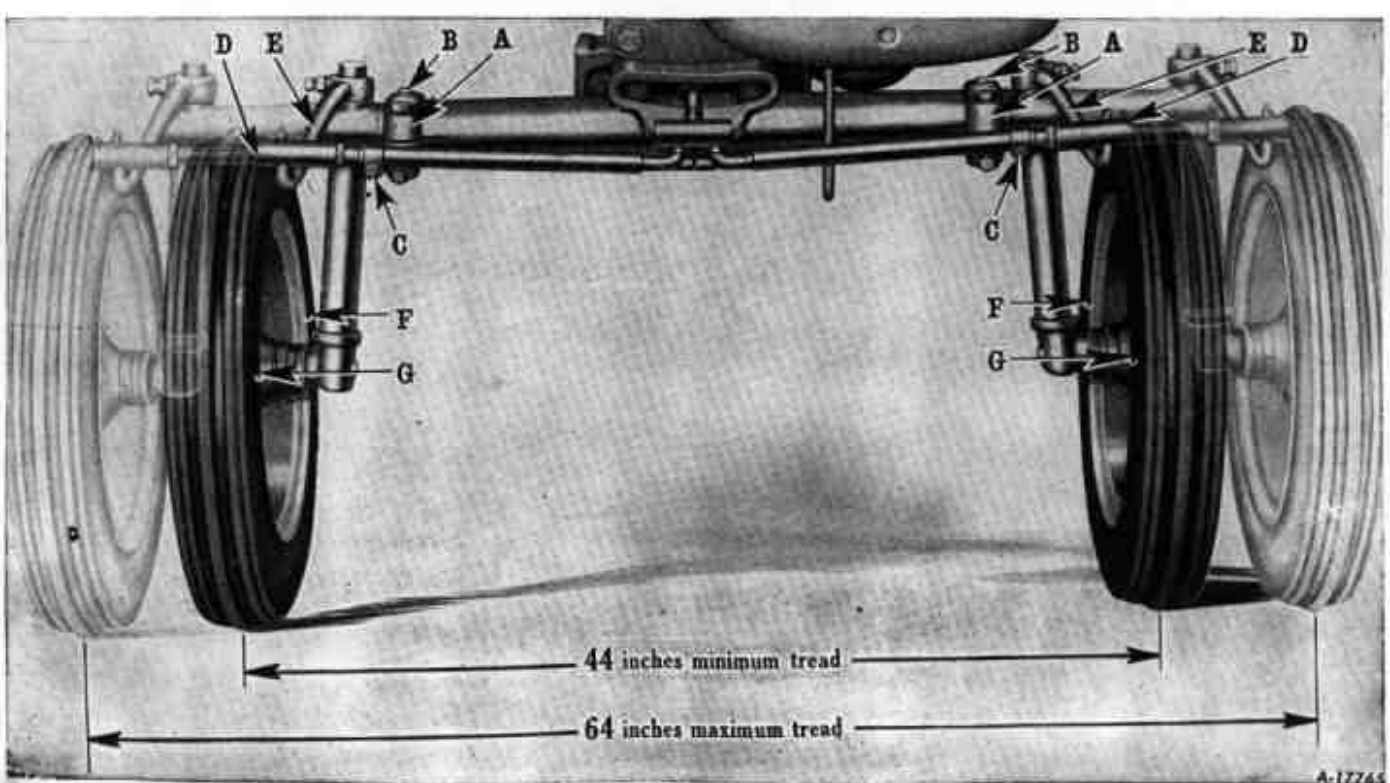
5. Replace the axle extension clamp pins "B" in the holes selected and tighten the clamps. Also replace and tighten the bolts in the tie rod clamps.

Adjusting the "Toe-In"

Front wheels should have ⅛-inch to ¼-inch "toe-in" (⅛ inch to ¼ inch closer in front than rear). Measure the distance between the two points "F" and the two points "G," *Illust. 49*. Points "F" and "G" must be at the outer edges of the rims and at the same height from the ground as the hub caps.

To adjust "toe-in," disconnect the steering knuckle arms "E" at "D," loosen the lock nuts and turn the tie rod ends "D" in or out as required.

Be sure to make the arm adjustments equal.



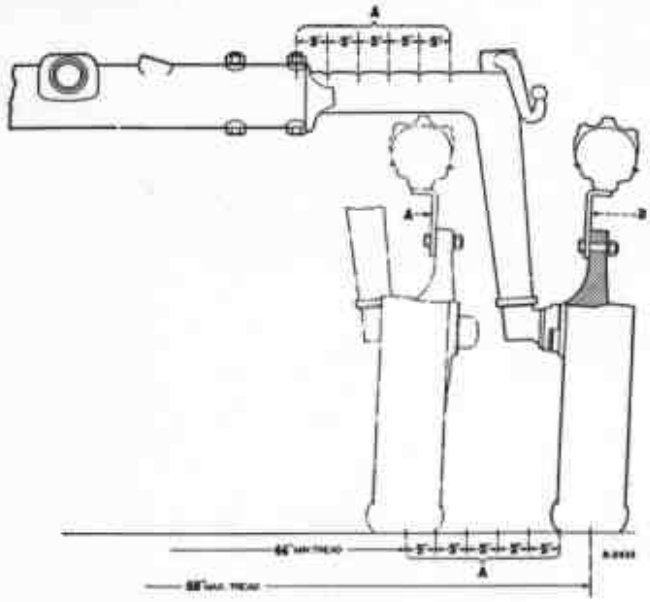
Illust. 49—Adjustable Wide Front Axle for Farmall Super-A.

To Adjust the Tread Widths (Super-AV Only)

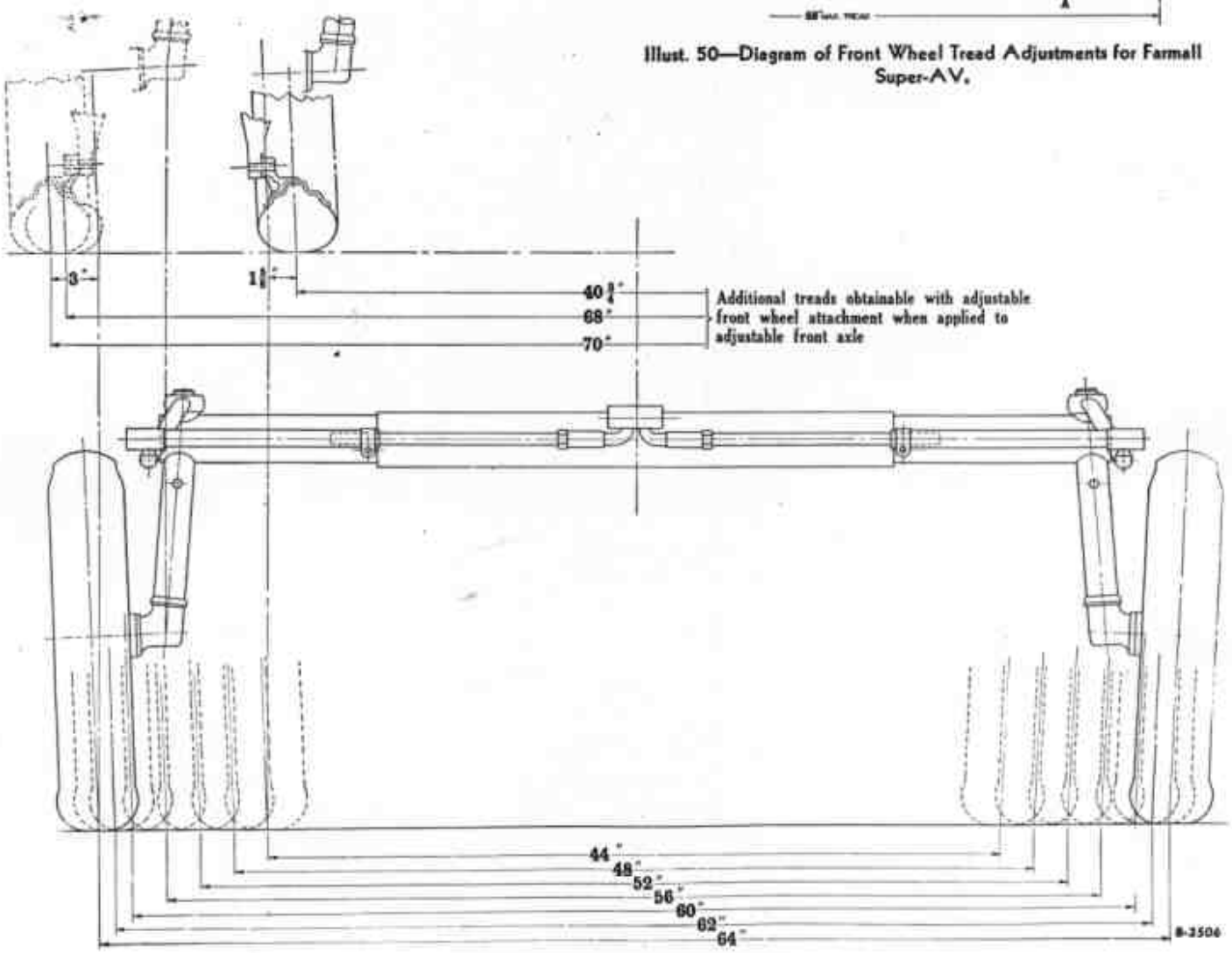
The Farmall Super-AV front wheels can be set in 44, 48, 52, 56, 60, 64 and 68-inch tread positions. Beginning with the front wheels in the minimum-tread position, adjustments can be made at 4-inch intervals up to 64 inches, *as shown at "A," Illust. 50.* For maximum-tread position (68 inches) reverse the position of the rim on the wheel and reassemble *as shown at "B."*

When assembling the front wheel rim be sure to use the washers and tighten the clamp bolts securely.

If your Farmall Super-AV is equipped with 7.50-16 front tires, the rim lugs are fastened to the



Illust. 50—Diagram of Front Wheel Tread Adjustments for Farmall Super-AV.



Illust. 50A—Diagram of Front Wheel Tread Adjustments for Farmall Super-A.

outside of the wheels with the rims turned in. Tread positions of 47 to 67 inches can be obtained by 4-inch intervals in a similar manner *as shown in Illust. 50.* Beginning with the front wheels in the minimum-tread position, adjustments up to 67 inches can be obtained *as shown at "A."* For a maximum tread of 71 inches remove the rims, turn them around and fasten the lugs to the outside of the wheels with the rims turned out.

Rear Wheels

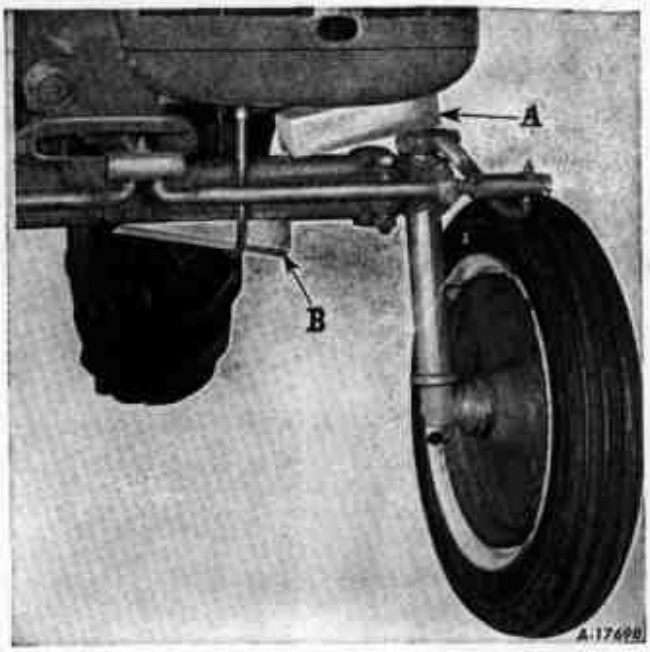
The Farmall Super-A uses a heavy cast iron disc type wheel on the right side and a pressed steel disc type wheel on the left side. Each wheel is mounted on the axle flange with six special cap screws and can be mounted with either the convex or concave side facing out. Mounting holes are provided for attaching cast iron wheel weights.

The wheels are equipped with demountable rims having attached clamps; the rims can be mounted on the wheels in several positions. Rims are available for 7.00/24, 9.00/24, 9–24, 10–24 and 11–24 agricultural type pneumatic tires. Rear wheel treads of 40, 44, 48, 52, 56, 60, 64 and 68 inches can be obtained by mounting the wheels amd rims in the positions *shown in Illust. 52.*

The Farmall Super-AV uses cast iron disc type wheels. They are mounted in the same manner as explained for the Farmall Super-A and also have the mounting holes for attaching wheel weights.

The wheels are equipped with demountable rims having attached clamps; the rims can be mounted on the wheels in several positions. Rims are available for 9–36 and 10–36 agricultural type pneumatic tires. Rear wheel treads of 48, 52, 56, 60, 64 and 68 inches can be obtained by mounting the wheels and rims in the positions *shown in Illust. 53.*

Illust. 51—Blocking the Front End of the Farmall Super-AV.



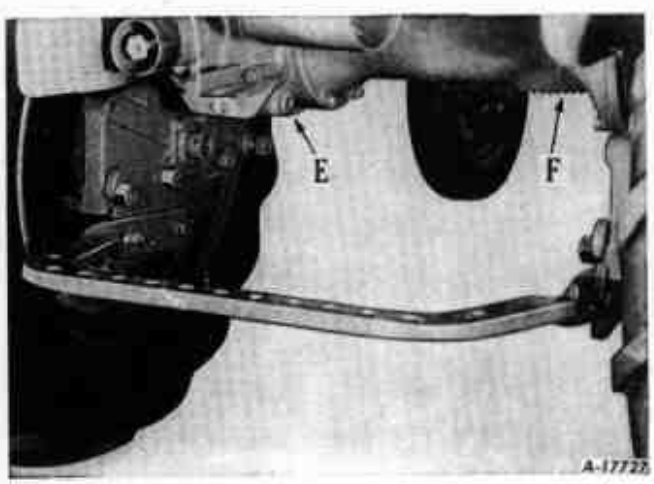
Illust. 51A—Blocking the Front End of the Farmall Super-A.

Removing or Changing the Positions of Rear Wheels

To remove the rear wheels or change rim positions, block the front end of tractor securely *as shown in Illusts. 51 and 51A.*

The front end of Farmall Super-A should be blocked *as shown in Illust. 51A* by putting a block "A" and wedge "B" in positions shown. Block the front end of Farmall Super-AV with wedges "C" and "D" *as shown in Illust. 51.*

After the front end of the tractor has been securely blocked, jack up the rear end at "E" and "F," *Illust. 51B,* and remove the six cap screws from the rear wheel hub.



Illust. 51B—Rear End of the Farmall Super-A.

To Adjust Rear Wheel Tread Widths (For Farmall Super-A Only)

The Farmall Super-A rear wheels can be set to 40, 44, 48, 52, 56, 60, 64 and 68-inch tread positions by attaching the rims in different positions on the wheels and by changing the positions of the wheels on the hubs as shown in Illust. 52.

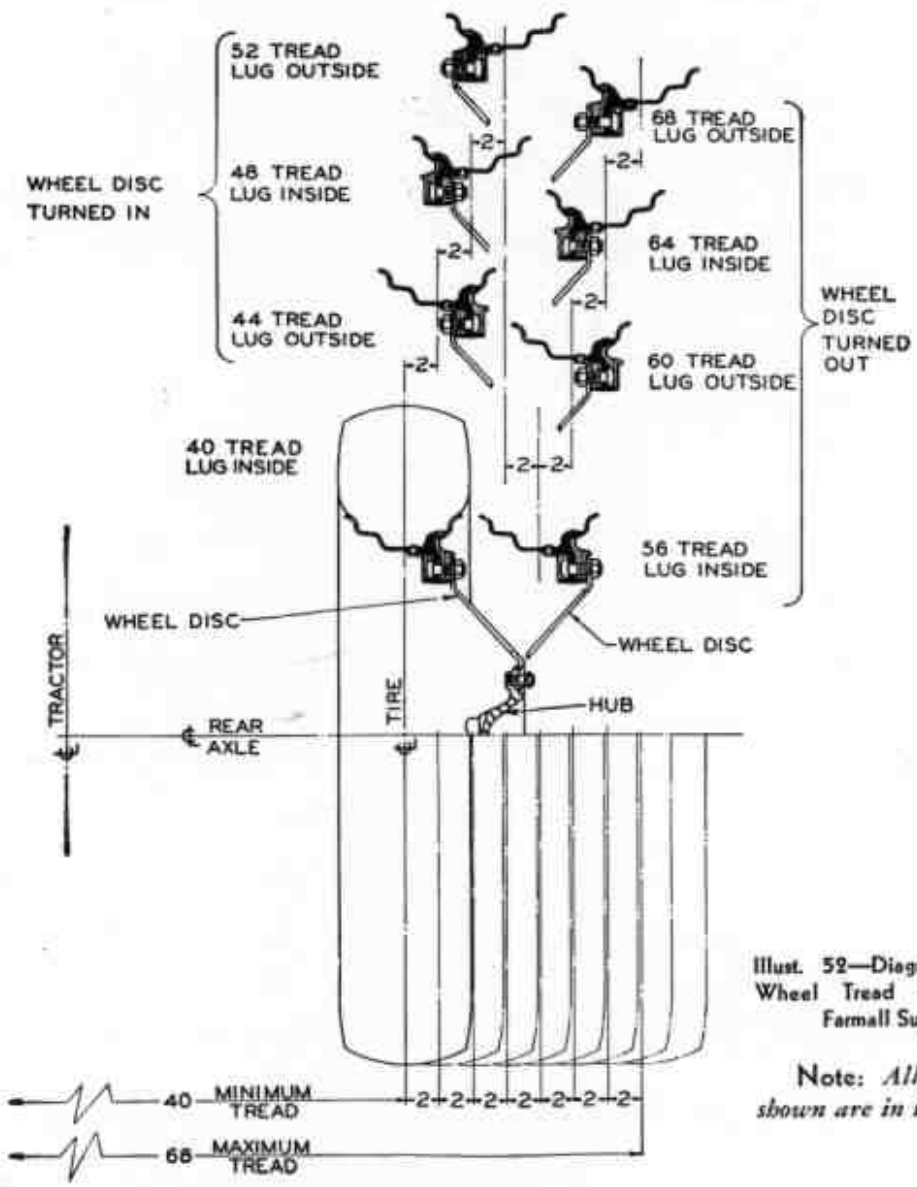
Note: When rims are reversed, change the tire and rim assembly, putting right-hand tire and rim on left-hand side and vice versa, in order to keep tread of tire pointing in the correct direction of rotation as shown by arrow on tire.

When assembling the rear wheel rim be sure to use washer in assembly and tighten clamp bolts securely.

Caution: Do not attempt to put right-hand (cast iron) wheel on left-hand side.

To Adjust Rear Wheel Tread Widths (For Farmall Super-AV Only)

The Farmall Super-AV rear wheels can be set to 48, 52, 56, 60, 64, and 68-inch tread positions by



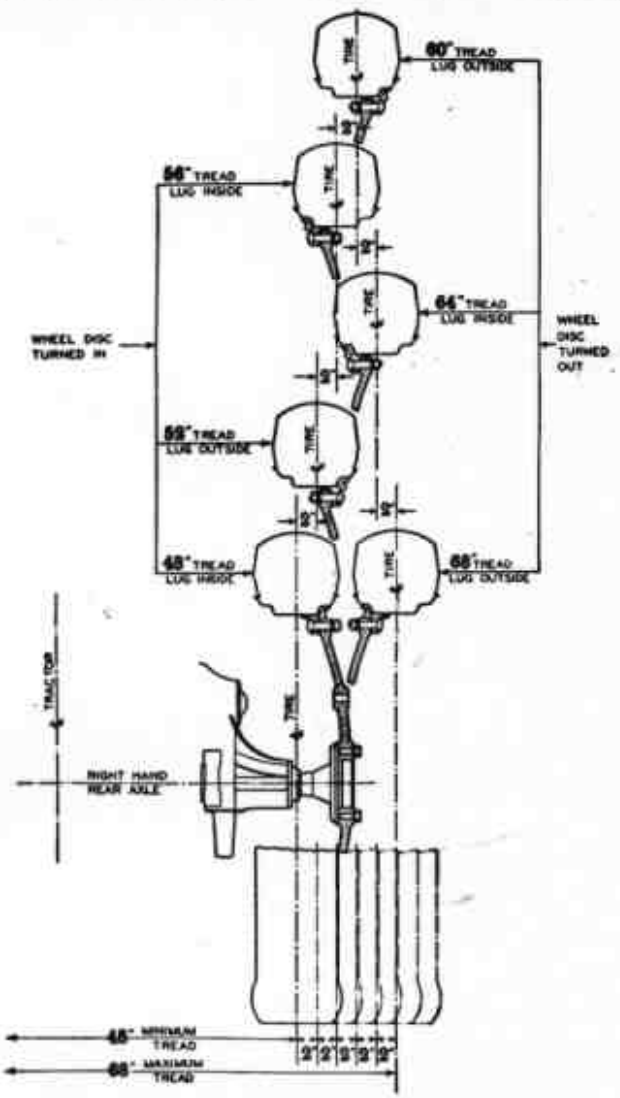
Illust. 52—Diagram of Rear Wheel Tread Positions for Farmall Super-A.

Note: *All dimensions shown are in inches.*

attaching the rims to the discs in different positions and by turning the disc in or out *as shown in Illust. 53.*

Note: When rims are reversed, change the tire and rim assembly, assembling right-hand tire and rim on left-hand side and vice versa, in order to keep tread of tire pointing in the correct direction of rotation as shown by arrow on tire.

When assembling rear wheel rim be sure to use washer in assembly and tighten clamp bolts securely.



Illust. 53—Diagram of Rear Wheel Tread Positions for Farmall Super-AV.

Pneumatic Tires

Follow the instructions and recommendations shown at right, above, in order to secure maximum life and efficient service from the pneumatic tires.

Inflation

Keep the pneumatic tires properly inflated to the pressures shown in the chart below. Underinflation will damage the tire cord body and may cause tire to slip on the rim and tear out the tube valve stem. Overinflation results in excessive slippage, causing rapid tire wear.

Check the air pressure once a week with an accurate low-pressure gauge having one-pound graduations. Do not allow the air pressure to drop below the recommendations.

Tires can be inflated with a pressure pump, hand pump, or a spark plug pump. Spark plug pumps, *page* 71, can be purchased from International Harvester dealers.

Always see that tire valve caps are in place and screwed tightly. The caps prevent the loss of air through the valve core, and also prevent loose soil, mud, gravel, snow, and ice from entering and damaging the valve core and air chamber in the tires.

Operating Pressure for Low-Pressure Tractor Tires

Caution! Adjust air pressure in tires as indicated below immediately upon receiving your tractor.

FRONT AND REAR TIRES	Lbs. Per Sq. In.	KG CM²
Front (All Sizes)		
A—4-Ply Tires	28	1.97
B—6-Ply Tires	36	2.53
Rear		
C—Minimum Inflation Pressure, 4 and 6-Ply Tires	12	.84
D—When plowing, increase pressure in tire on furrow wheel by	4	.28
E—When special heavy wheels are used, or heavy implements such as corn pickers, bedders, etc., are carried on the tractor, inflation pressure must be increased. See tire and rim association schedule or contact the tractor dealer or manufacturer.		
F—Maximum Inflation Pressure, 4-Ply Tires	16	1.12
G—Maximum Inflation Pressure, 6-Ply Tires	24	1.68

Shipping Tractors Equipped with Pneumatic Tires

When tractors are transported on a carrier, such as railroad cars or trailers, inflation pressures should be as follows to make possible rigid blocking and to prevent bouncing:

All 4-ply front tires.....30 lbs.
All 6-ply front tires.....36 lbs.
All rear tires.....30 lbs.

Important: Deflate the tires to correct operating pressure before the tractor is transported under its own power, towed, put into service, or placed in storage for any length of time; otherwise, the rubber will check or crack.

Maximum speed for highway use should not exceed 20 m.p.h. For farming operations a maximum speed of 10 m.p.h. is recommended.

When towing tractors, do not exceed a speed of 20 m.p.h.

Mounting Tires on the Rim

After mounting a new or old tire on the rim, inflate it to 30 lb. pressure to seat the tire bead on the rim flange and to prevent the tire from creeping and shearing off the valve. Then deflate or inflate the tire to the correct operating pressure.

Traction and Weights

The recommended air pressures *are shown on page 53.* The tractor should not be operated with the tires improperly inflated. To insure the maximum hours of service, watch the tread lugs—if they wear down too fast, immediately add more weight to cut down slippage. Check for high air pressure. *Consult your International Harvester dealer for information.*

Wheel Weights

The drawbar pull of a tractor can be increased by adding cast-iron weights to the driving wheels, and by the use of liquid in the tire tubes.

The amount of the increase in drawbar pull by the addition of certain definite weights varies with the type of soil. When very heavy weight is required, both liquid and cast-iron weights can be used.

Overloading

Do not overload the tractor tires by mounting implements on the tractor which exceed the load capacity of the size tires on the tractor.

After adding weight to the rear wheel it may be necessary to readjust the height of drawbar to get the correct alignment.

Liquid Weight

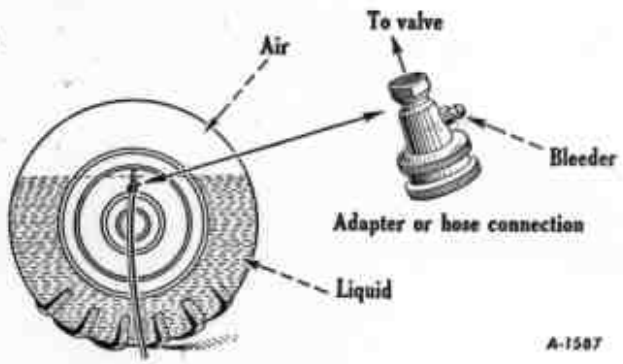
Tractor tire tubes can be filled ¾ full with liquid, using clean water for temperatures above freezing (32° F.). A calcium chloride solution ($CaCl_2$) is recommended when operating in freezing temperatures.

Methods of Putting Liquid into Tube

Purchase an adapter, *Illust 54,* from an International Harvester dealer. The adapter is equipped with a bleeder for letting out the air displaced by the liquid.

Jack up the tractor and revolve the tire so that valve stem is on top. Remove the valve core housing, and screw on the adapter, then attach the water hose to the adapter.

The liquid can be put into the tube from a tank placed at least five feet higher than the tire, by using a hand force pump or by using compressed air and a pressure tank filled with liquid.



Illust. 54—Tires Three-quarters Full of Liquid.

Remove the hose and adapter; then replace valve core housing, and inflate tire to correct operating pressure.

Liquid Weight for Freezing Temperatures

Calcium chloride solution, using a 25% mixture, which is approximately 20 lb. of flaked calcium chloride to 10 U.S. gallons of water, is recommended when freezing temperatures prevail.

The strength of the solution can be checked with a battery hydrometer. A 25% solution measures approximately 1.225 specific gravity and has a freezing point of 25° below zero.

Caution! Some calcium chloride flakes have an acid reaction. It is advisable to add one pound of lime to each 100 pounds of calcium chloride used.

When preparing calcium chloride solution, always pour the water into the container first; then add the correct amount of calcium chloride crystals, stirring the mixture thoroughly. Never pour the water on the calcium chloride flakes. After the solution is mixed, allow it to cool before using.

Valve Stem Mounting Cones

Valve stem mounting cones are furnished with all rear wheel tire tubes having valve stem for inserting liquids, and are mounted on the valve stem at the factory.

The purpose of the cone is to hold the valve stem in the valve hole when mounting tire, particularly when liquid is used in the tire. Without the cone when mounting the tire or inserting the liquid, the valve stem is very apt to be pulled into the rim and will entail much extra work in again getting it through the valve hole.

Care of Tires

Avoid stumps, stones, deep ruts and other hazards. Cuts in tires should be repaired immediately as neglect decreases the tire life.

Keep tires free from oil and grease as both destroy rubber.

After using the tractor for spraying—insect control work—wash off with water any chemicals that may be on the tires.

Tire Protection During Storage

When not in use, store the tractor so that the tires are protected from the light. Before storing the tractor, clean the tires thoroughly. Jack up the tractor so that load is off tires when it is to be out of service for a long period. If it is not jacked up, inflate the tires at regular intervals. Before driving the tractor, inflate tires to correct operating pressures.

Tire Chains

For wet grass or ground conditions, use lug type chains. The flexing of the tire and creeping of chains will break the mud loose as the wheel rotates.

There is a possibility of the tire slipping within the chain; to prevent this, the use of spring type chain fasteners is recommended.

Static Electricity in Tractors Equipped with Pneumatic Tires Doing Belt Work

Static electricity generated by belt work can be discharged harmlessly by attaching a chain to the tractor and letting it touch the ground.

Farmall Touch-Control System

The Touch-Control system is ready to operate whenever the engine is running. You will receive the maximum of satisfactory service by closely adhering to the following simple precautions and service operations.

The importance of keeping the system free from all dirt, grit and other foreign matters cannot be stressed too strongly. Keep the oil reservoir, pipe lines and pump as clean as possible at all times. As an added precaution against the entry of dirt into the system, the oil reservoir is constructed without an air vent. Sufficient air space is allowed above the oil level to compensate for the pressure changes occurring during the operation of the system. As a result a small amount of pressure may be found in the reservoir upon removing the filler plug when checking the oil level.

Oil Level

When the tractor is shipped from the factory the Touch-Control system is filled to the proper level with SAE-10W oil and it should not require servicing, unless for some reason the system has been disturbed.

If the Touch-Control system should fail to operate in a satisfactory manner or if there are any noticeable leaks in the system, check the oil level in the reservoir or see your International Harvester dealer's serviceman.

Never operate the tractor without having sufficient oil in the oil reservoir. Insufficient oil may cause damage to the Touch-Control system.

Before removing the oil filler plug "A," *Illust. 56,* for inspection, thoroughly clean the plug and surrounding area of all dirt and grit.

The correct oil level is to the bottom of the filler opening. If it is necessary to add oil use a good grade of SAE-10W engine oil. It is essential that the oil be absolutely clean and free from water and all foreign matter when placed in the system. Cloudiness of an oil may indicate the presence of moisture.

Draining and Filling the Oil Reservoir

When it is necessary to drain and refill the oil reservoir for any reason, proceed as follows:

1. Wipe off all dirt and grit from the reservoir and filler plug.

2. Remove the filler plug "A" and the drain plug "B," *Illust. 56,* and place them in a clean container.

When the oil has stopped draining, run the engine very briefly to drain the oil from the pump and connecting pipes.

The refill capacity of the Touch-Control system when drained as instructed above is 6¾ pints.

Note: If it is necessary to flush the system use only the grade of oil specified for operation (SAE 10-W) so that the necessary lubrication of the pump and control system is maintained without adulteration. Never use kerosene or any other grade of oil.

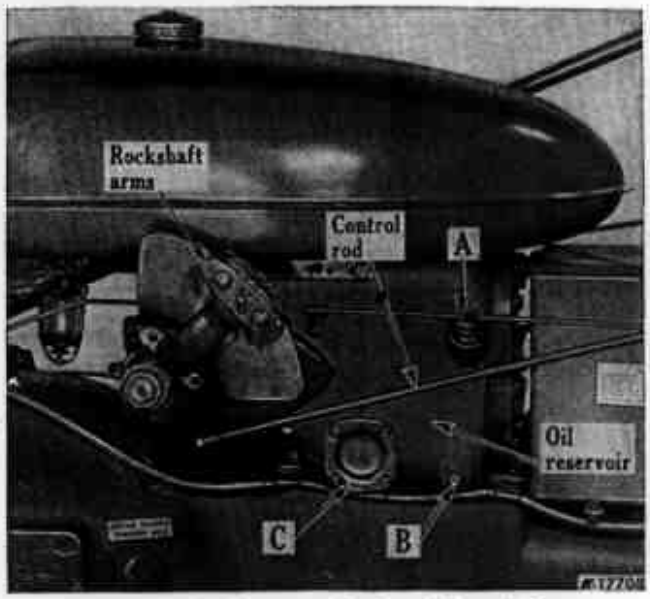
3. The cylinder block oil strainer "C," *Illust. 56,* should be removed and cleaned whenever the oil reservoir is drained.

To clean the strainer, remove the four cap screws which hold the strainer to the cylinder block and pull out the screen. If your tractor is equipped with a radiator shutter it will first be necessary to disconnect the radiator shutter control rod. Clean the strainer thoroughly in kerosene and wipe off all dirt and grit from the cylinder block. Replace the strainer and make certain that the gasket is in perfect condition. If the gasket is damaged, replace it with a new one.

4. After the system has drained completely, replace the drain plug and fill the reservoir to the filler opening with a good grade of clean SAE 10-W engine oil.

5. Start the tractor engine and operate it at a moderate idle speed. With the filler plug removed, move both Touch-Control levers back and forth 10 to 12 times through their full range of travel. This quickly frees the system of trapped air. Then place the control levers in the rearward position (toward tractor seat) and stop the engine.

6. Add sufficient clean SAE 10-W engine oil to the reservoir to bring the oil level to the bottom of the filler opening. Replace and tighten the filler plug.



Illust. 56—Oil Reservoir for Touch-Control System.

The refill capacity for the Touch-Control system when drained as instructed in paragraph 2 is 6¾ pints.

The capacity of a completely dry unit (when a new or rebuilt unit is installed) is 8¼ pints.

Lubrication

Daily or after every 10 hours of operation lubricate the rockshaft arm and bearings as instructed in the "Lubrication Guide."

Note: Always keep the Touch-Control levers in the rearward position (toward tractor seat) when the tractor or the Touch-Control system is not being actively used. This places the piston in the retracted position, preventing exposure to any moisture which may have condensed in the leather dust boot.

Air in the System

Make certain that all connections and openings are well sealed. The entire system must be kept oil-tight at all times, not only to prevent loss of oil but also to avoid entrance of air in the inlet end of the system. Air entering the system interferes with proper lubrication of moving parts. It causes an increased amount of vibration and an unsteady pressure. Presence of air in the system will be noticed by a noise in the pump or by the pump laboring when operating under high pressure. Proper filling of the oil reservoir and working the system during the filling process as previously described, will work the air out of the system.

Drawbar and Hitch

Do not attempt to pull when drawbar is removed.
Drawbar bolts must be kept tight.
All hitches for trailing implements must be attached to the drawbar.

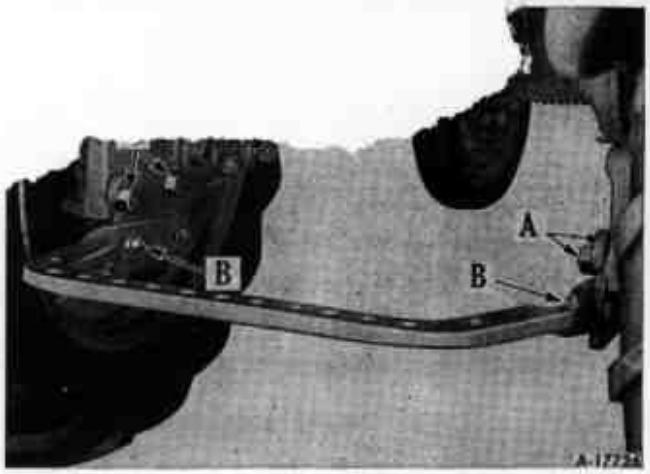
The tractor exerts its pulling power on pull-behind implements by means of the drawbar which is adjustable up and down to accommodate different hitches. Proper hitching will save both the tractor and the implement it is pulling from undue strains. Make the hitch so that the center line of pull of the tractor will fall in line with, or at least near the center line of draft of the hitched-on implement. Hitching to one side or the other of the line of draft will cause stresses and strains on both the tractor and the implement being pulled, frequently great enough to do permanent damage. Incorrect hitching will also tend to make the tractor difficult to steer and will result in unsatisfactory work by the implement being pulled.

When using a long chain to hitch the tractor to the load, drive the tractor forward slowly until all slack is taken out of the chain.

Never stand between the tractor and the drawn implement when hitching.

Always hitch to the tractor drawbar, and when pulling a heavy load, pull stumps, rocks, or fence posts —don't take up the slack of the chain with a jerk.

When tractor is pulling power equipment, be sure that all power line shielding is in place and in good order.

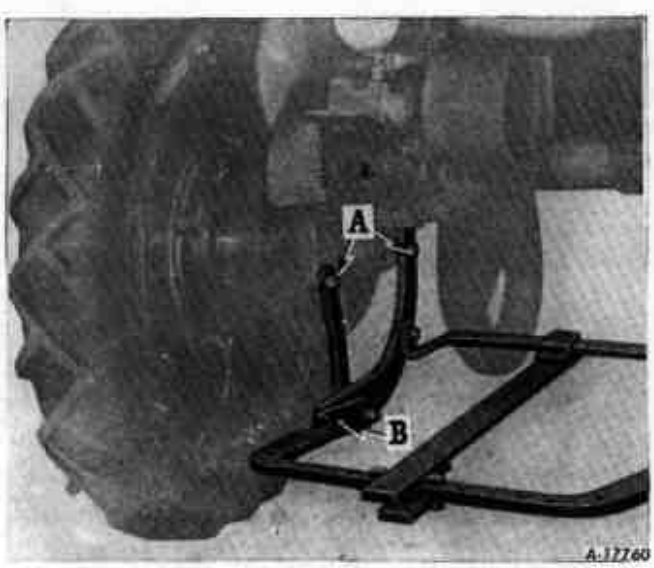


Illust. 58—Drawbar Adjustment on the Farmall Super-A.

The quick attachable drawbar can be easily removed, or reversed and placed in the forward position. To remove the drawbar, loosen bolts "A," *Illusts. 58 and 58A,* and unhook the complete drawbar.

Adjustment of Drawbar

The drawbar can be set at four different heights to obtain the proper hitch position.



Illust. 58A—Drawbar Adjustment on the Farmall Super-AV.

To obtain the desired hitch position, remove the cap screws "B," *Illusts. 58 and 58A.* Raise or lower the drawbar until it is at approximately the required height, then line up the two holes in the drawbar with the two closest holes in the drawbar brackets. Replace the cap screws through the holes selected and fasten them securely with the nuts and lock washers.

Seat

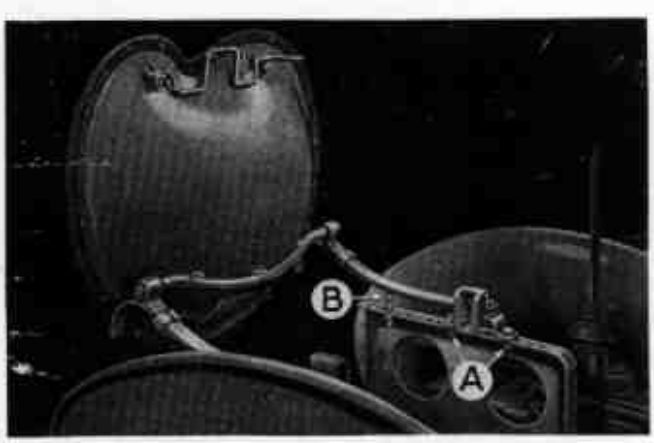
The tractor seat can be adjusted to the most comfortable position for the operator.

Adjustment

1. To relocate the seat remove the four bolts, "A," holding the spring lower support brackets to the seat support brackets, and reinstall at the desired position.

2. Adjust the springs for flexibility by relocating the stop screws "B" under the spring leaves at a point which gives most confortable ride. Stop screws should just contact the spring when the seat is in free position.

Be sure the stop screws are set in same relation to spring on both sides.



Illust. 58B—Seat Turned Back to Show Points of Adjustment.

MAINTENANCE

Trouble Shooting

Hard to Start

Possible Cause	Possible Remedy
No gasoline in starting tank or carburetor	Fill tank with new gasoline, open fuel shut-off valve. Check fuel lines, fuel strainer and carburetor.
Distillate in starting fuel or carburetor	Drain the carburetor and use gasoline for starting, *page 13.*
Gasoline strainer or fuel lines clogged	Clean fuel strainer, check fuel lines and carburetor.
Impulse coupling inoperative	Flush with kerosene, *refer to page 36.*
Water in gasoline	Drain fuel tank and carburetor. Use new fuel, and dry spark plugs or see your dealer's serviceman.
Water in cylinders	Check cylinder head gasket or look for clogged drain hole in exhaust manifold or muffler.
Choked improperly. Flooded engine	Follow starting instructions, *pages 10 and 11.*
Defective ignition or loose wiring	Check wiring, plugs and magneto, etc., *refer to pages 35 to 44.*
Defective battery or starting motor	Check and service, *refer to pages 42 and 43 or replace.*
Spark plugs dirty or improper gap	Clean, adjust gap to .023" to .027", or replace plugs.
Magneto grounded	Pull out on ignition switch. Check for other possible ground, also refer to magneto instructions, *page 36.*
Engine speed control not advanced	Advance lever ¼ for starting.
Lack of compression	See your dealer's serviceman.
Flywheel ring gear teeth broken	See your dealer's serviceman.
Too heavy grade of lubricating oil	Drain and refill with proper lubricant. *Refer to "Lubricant Specifications," page 27.*
Gears engaged	Put gear shift in neutral.
Internal seizure	See your dealer's serviceman.

Engine Operates Irregular or Knocks

Engine incorrectly timed	Retime. See "Magneto," *page 38.*
Spark plugs dirty; wrong gap or wrong type	Clean; reset gap to .023" to .027" or replace.
Poor or weak spark	Check magneto if spark is good from coil. Check distributor points and gap; spark plugs, and wiring, *see page 35.*
Carburetor setting incorrect	Adjust as per "Carburetor" instructions; *page 30.*
Poor grade fuel or water in fuel	Drain and use a good grade of clean fuel.
Engine overheating	Check cooling system and fan belt, adjust radiator shutter if used, see instructions "Engine Overheats".
Operating a cold engine on distillate	Warm up engine on gasoline before changing over to distillate fuel.
Engine valves at fault	Check valve clearance or see your dealer's serviceman.
Air leaks around intake manifold	Check gasket and tighten nuts.
Engine smokes	Check air cleaner oil level. Check fuel delivery at carburetor. Check for worn piston and rings or see your dealer's serviceman.
Excessive carbon in engine	See your dealer's serviceman.
Loose piston pin or bearings	See your dealer's serviceman.
Broken rings or loose pistons	See your dealer's serviceman.
Worn connecting rod and main bearings	See your dealer's serviceman.
Governor sticking or needs adjustment	See your dealer's serviceman.

Lack of Power

Engine speed lever not advanced	Advance speed control lever.
Engine cold or overheated	Run engine until it warms up before putting under load. Adjust radiator shutter if used. Check cooling system or see your dealer's serviceman.
Engine overloaded	Reduce load.
Engine knocks excessively	Use good fuel; also check timing or see your dealer's serviceman.

Possible Cause	Possible Remedy
Governor not working properly	See your dealer's serviceman.
Poor compression	Service valves and piston rings, or see your dealer's serviceman.
Poor fuel or too lean a mixture	See carburetor instructions, *page 30.*
Fuel lines or strainer obstructed	Clean, *page 29.*
Fuel tank air vent closed	Open vent in cap.
Exhaust pipe clogged	Clean out.
Air cleaner clogged or air leakage between carburetor and engine	Clean air cleaner as instructed on *page 34.* Tighten carburetor and manifold mounting nuts.
Too heavy oil in crankcase or air cleaner	Drain and refill with proper lubricant. *Refer to lubricant specifications, page 27.*
Incorrect timing or faulty ignition	See "Magneto," *page 35.*
Clutch slipping	Adjust pedal free travel, *page 46,* or see your dealer's serviceman.
Brakes drag	Adjust brakes, *page 47.*

Engine Overheats

Cooling system clogged or limed	Clean system, *refer to page 32 or see your dealer's serviceman.*
Fan belt slipping	Adjust or replace belt, *refer to page 33.*
Insufficient water in cooling system	Fill radiator to proper level, *refer to page 32.*
Radiator cores clogged	Remove all chaff or dirt from the radiator grille, clean with a hose if available.
Wrong kind of fuel	Change to a good grade of gasoline.
Carburetor improperly set	Refer carburetor, *page 30.*
Timing incorrect	Check per "Magneto" instructions, *page 38.*
Breaker point gap incorrect	Adjust gap per "Magneto" instructions, *page 37.*
Excess load	Reduce load.
Excess carbon in engine	See your dealer's serviceman.
Temperature gauge defective (distillate engine)	Replace gauge or see your dealer's serviceman.
Radiator shutter closed (if used)	Open shutter.

No Oil Pressure, Too High or Too Low

Defective oil gauge	Replace or see your dealer's serviceman.
Wrong grade, diluted or insufficient oil	Refer to lubricant specifications, *page 27.* Check oil level; if diluted, replace with fresh oil, refer to operating instructions.
Broken, loose or plugged oil lines	Clean and tighten or see your dealer's serviceman.
Low oil level in crankcase	Add oil, refer to "Lubrication Guide." Check for oil leak.
Defective or dirty oil pressure regulating valve	See your dealer's serviceman.
Oil pump strainer clogged or pump not working	Clean as instructed on *page 20 or see your dealer's serviceman.*
Worn bearings	See your dealer's serviceman.

Oil Dilution or Uses Too Much Oil

Incorrect grade of oil	*Refer to lubricant specifications, page 27.*
Leaks in oil lines or filter, or oil pan plug or gasket	Check and tighten or see your dealer's serviceman.
Worn piston or oil rings	See your dealer's serviceman.
Loose connecting rod bearings	See your dealer's serviceman.
Long engine idling	Stop engine.
Engine overheating or too cold	Refer to section "Lack of Power and Engine Overheats."
Engine speed too high	See your dealer's serviceman.
Crankcase breather clogged	Clean the breather cap, as instructed on *page 20.*

Possible Cause	Possible Remedy

Using Too Much Fuel

Fuel mixture too rich. Carburetor out of adjustment	Check choke and see Carburetor instructions, *page 30.*
Fuel leaks	Tighten or replace fuel lines or fuel strainer gasket.
Poor grade of fuel	Use a good grade of gasoline.
Choke closed	Investigate for choke not operating.
Engine overloaded	Reduce load or shift to lower speed.
Poor compression	See your dealer's serviceman.
Faulty ignition	*Refer to pages 35 to 37.*
Engine not operating at proper temperature	Check cooling system. Check lubricating oil or see your dealer's serviceman.
Air cleaner clogged	Service air cleaner, *page 34.*
Incorrect grade or amount of lubricating oil	*Refer to "Lubricant Specifications," page 27, and keep the oil up to the proper level.*

No Fuel at Carburetor

Fuel low in tank	Fill fuel tank and check fuel lines.
Air vent hole in fuel tank cap plugged up	Clean out vent hole.
Fuel valve closed or partly open	Open valve, refer "Starting Instructions," *pages 10 and 13.*
Dirty or clogged fuel strainer screen or line	Clean as instructed on *page 29.*

Ignition and Electrical

Wrong kind, old, cracked, dirty, or poorly set spark plugs	Clean and set gap to .023" to .027", or replace with new one.
Loose wiring or improper connections	Check wiring, to see that all connections are clean and tight, *pages 35 to 44.*
Magneto not timed correctly	Retime as instructed on *page 38.*
Distributor cap or rotor or breaker chamber dirty	Clean as instructed on *page 36.*
Distributor brush broken	Replace brush or see your dealer's serviceman.
Breaker points dirty, pitted or improperly set	Clean and reset gap or replace with new, *page 36.*
Breaker arm stuck, weak or broken spring	Check and replace, *page 36.*
Impulse coupling dirty	Clean and lubricate as instructed, *page 36.*
Battery defective, low charge or loose connections	Recharge, clean and tighten cable lugs or replace with new, check ground cable, *refer to pages 40 to 43.*
Starting motor failure	Replace or see your dealer's serviceman.
Generator inoperative	Clean commutator, check brushes, *page 41,* or see your dealer's serviceman.
Generator relay	See your dealer's serviceman.
Ammeter inoperative	Replace ammeter or see your dealer's serviceman.
Ammeter shows excessive charge	Adjust generator charging rate, *page 41.*
Ammeter shows discharge	Check battery and generator, check drive belts and wiring.
Lights will not burn	Check battery ground cable. Turn on switch, replace bulbs, replace fuse, recharge battery, check wiring and generator, or see your dealer's serviceman.
Lights burn dim	Turn switch to bright. Recharge battery, tighten cable terminals, check bulbs, adjust generator charging rate, clean contacts.

Brakes

Do not hold	Adjust brakes, *page 47* or new lining needed or see your dealer's serviceman.
Drag or uneven	Adjust brakes, *page 47.*
Grease on lining	Replace lining or see your dealer's serviceman.
Return spring broken	Replace.
Do not release	Release brake lock. Be sure that the left-hand brake cross shaft is free to turn.

Possible Cause	Possible Remedy
Transmission, Belt Pulley and Power Take-Off	
Hard to shift gears	Use correct grade of lubricant, *page 27*.
Shifter fork or lever defective	Replace or see your dealer's serviceman.
Engine clutch drags	Refer under "Lack of Power."
Gears clashing	Stop tractor and disengage clutch before shifting gears.
Gears slipping out of mesh	See your dealer's serviceman.
Noisy	Check oil level, use proper grade lubricant or see your dealer's serviceman.
Damaged parts	See your dealer's serviceman.
Rear Wheels	
Do not turn	Release brake lock. Transmission, differential or clutch faulty. Refer to "Transmission Section" or see your dealer's serviceman.
Front Wheels	
Too tight or too loose	Check lubricant in bearings, check bearing adjustment, *page 26*.
Lubricant leakage	Check oil seal or see your dealer's serviceman.
Steering	
Faulty	Check steering worm and gear, check front axle adjustment, *page 48, 49 and 50*. Check lubricant in front wheel. Check tire inflation or see your dealer's serviceman.
Defective front axle	Inspect linkage, check and replace faulty parts or see your dealer's serviceman.
Tractor turns to one side	Check and adjust brakes evenly, *page 47*. Check pneumatic tire air pressures. Check front axle adjustment, *page 48, 49 and 50*.
Pneumatic Tires	
Excessive or uneven wear	Check for toe-in, *page 50*. Check air pressure and check load on tires, *page 53 and 54*.
Slippage, rear tire	Add more weight, and check for high pressure, *page 53*. If tread is badly worn, tires may slip more readily. Replace with new tires or use lug-type chains.
Farmall Touch-Control System	
Refer to detailed instructions on *pages 55 and 56* or see your dealer's serviceman.	

STORING AND HOUSING YOUR TRACTOR

Storing and Housing Your Tractor

When your tractor is not to be used for a period of time, it should be stored in a dry and protected place. To leave equipment outdoors, exposed to the elements, will result in materially shortening the life of the machine.

Follow the procedure outlined below when your tractor is placed in storage, and repeat the lubrication precautions every six months thereafter. We also recommend caution to be practiced in starting an engine that has been in storage.

1. Wash or clean and completely lubricate the tractor (refer to "Lubrication Chart").

2. Drain and flush the cooling system.

3. Oil the magneto impulse coupling liberally with very light oil such as cream separator or sewing machine oil.

4. After the engine has cooled off, remove the spark plugs and pour one tablespoon of SAE-50 lubricating oil of a good grade into each cylinder. Crank engine 2 or 3 times to distribute oil over the cylinder walls. Then replace the spark plugs.

5. Remove valve housing cover and flush valves, rocker arms, and push rods with SAE-50 oil. (If any evidence of rust is found, remove it before lubricating.) Replace valve housing cover.

6. Plug up the end of the breather pipe and exhaust pipe.

7. Remove the oil filter element. (If any evidence of rust is found on the center stud, clean thoroughly.) Replace the old filter element with a new one and flush out any sludge from filter base as instructed on *page 21*.

8. Drain the fuel from the fuel tank and carburetor, and clean out the fuel strainer glass bowl.

Caution! Gum will eventually form in tanks, lines and carburetor if unit is not used. Gum in carburetor jets and passages affects engine starting. Gum can be dissolved with acetone or a 50-50 mixture of alcohol and benzol.

9. If the tractor is equipped with a storage battery, remove the battery and place it on a rack in a cool room and check battery at least once a month for water level and specific gravity, *page 43*.

Starting Engines That Have Been in Storage

1. Remove the spark plugs and pour a mixture of one-half gasoline and one-half light lubricating oil into each cylinder (2 tablespoonfuls per cylinder is enough).

2. Remove the valve housing cover, and flush the valve and valve operating mechanism with the same mixture.

3. Crank the engine rapidly until excess oil has been blown out of the spark plug holes. This operation will loosen any tight piston rings and wash old gummy oil from valves and pistons.

4. Flush out the impulse coupling with kerosene, and lubricate as specified.

5. Drain the crankcase and flush out with kerosene or flushing oil and fill with specified lubricating oil. (See "Lubrication Chart.")

6. Be sure the lubricating oil filter has a new element before starting the engine.

7. Remove the crankcase breather pipe plug and the exhaust pipe plug.

8. Install the spark plugs after cleaning and setting the gaps.

9. Fill the water cooling system.

10. Fill the fuel tanks.

11. Install a fully charged battery (if used) and be sure the proper connections are made.

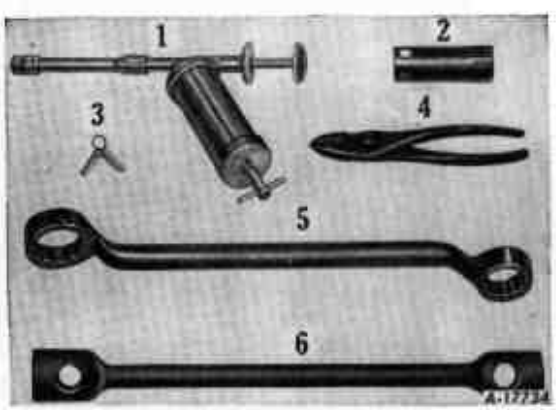
12. Clean the air cleaner and refill the oil cup.

13. Start the engine and let it run slowly; observe if any valves are sticking. If so, pour a small quantity of kerosene on the valve stem until loose.

14. Assemble the valve housing cover.

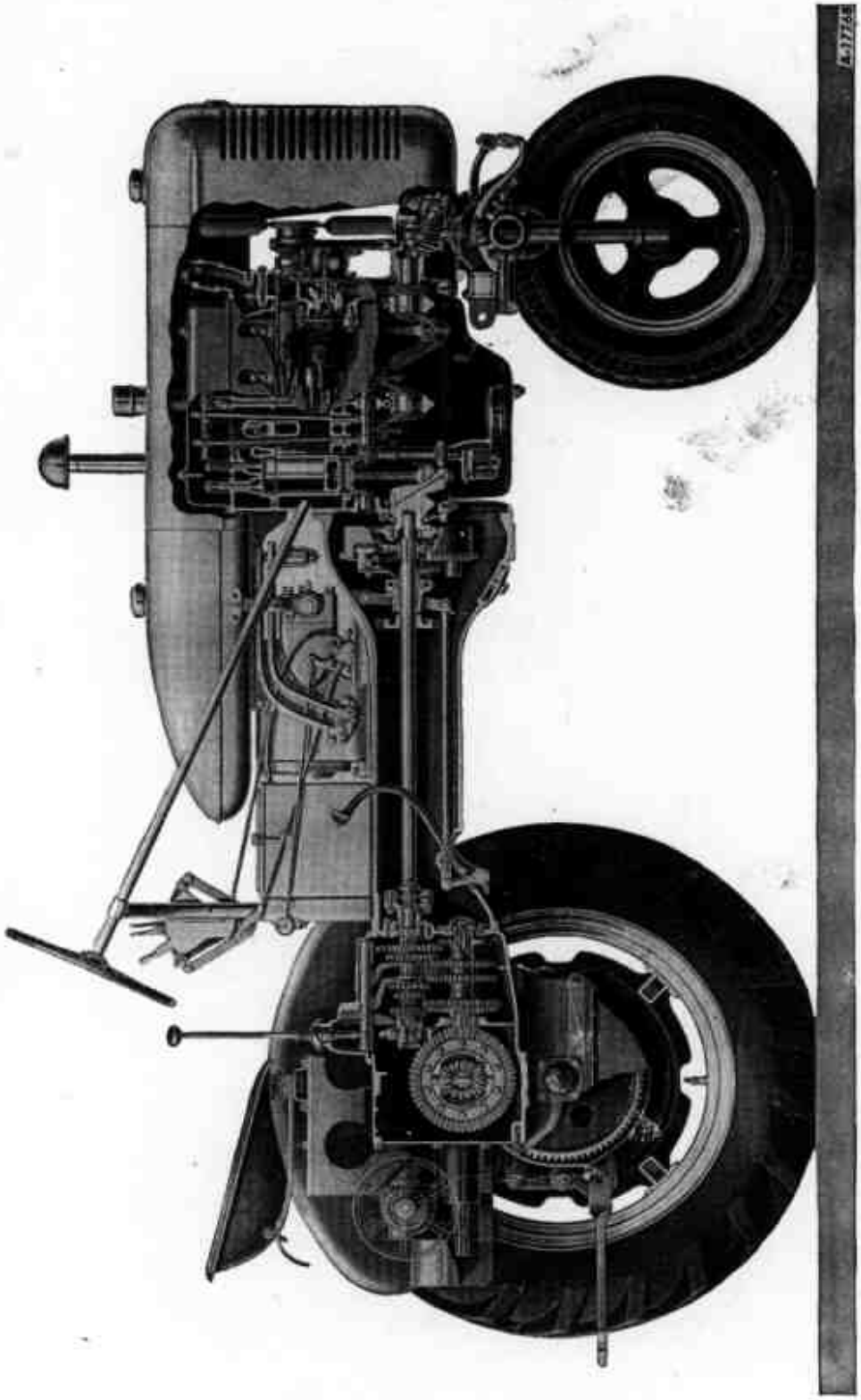
Caution! Do not accelerate the engine rapidly or operate at high speed immediately after starting.

Tools



Illust. 63—General Service Tools Furnished with the Tractor.

Ref. No.	Description
1.	Hand lubricator (3-oz. size).
2.	Spark plug wrench.
3.	Breaker point and spark plug gauge.
4.	Pliers (8 inches long).
5.	Quick attachable drawbar wrench.
6.	Double end socket wrench.



Illust. 64—Cutaway view of Farmall Super-A.

SPECIAL EQUIPMENT

The Farmall Super-A and Super-AV tractors are used for so many different types of work and are called on to operate under so many different conditions that a considerable variety of special equipment is necessary to adapt them to the varied requirements of the user.

The tractor, as regularly supplied, is equipped to perform straight drawbar work. Beyond that the special equipment requirements are so diverse that it is impractical to include any such equipment regularly on the tractor. In many cases you would be paying for equipment you do not need or want.

These special attachments can be installed on the tractor at any time, and once installed become a permanent part of your tractor.

Below is an index of the special equipment available. The instructions for operating and maintaining these attachments have been incorporated into the instructions for operating and maintaining the tractor. Supplemental information will be found in the following pages. You are urged to read and study this information in order to assure satisfactory service.

Special equipment must not be ordered from this manual. To order attachments consult your International Harvester dealer, giving the tractor and engine serial numbers.

TYPES OF EQUIPMENT	ATTACHMENT NUMBER		PAGE NO.
	Farmall Super-A	Farmall Super-AV	
Adjustable Front Axle	48 290 DA	.....	
Adjustable Tread Front Wheels	57 098 D	.....	49
Air Pipe Extension	63 258 D	63 258 D	63
Belt Pulley and Power Take-Off	352 445 R91	352 445 R91	66
Collector Precleaner	59 206 D	59 206 D	63
Exhaust Muffler	48 831 DA	48 831 DA	66
Electric Starting and Lighting	350 731 R91	350 731 R91	39 to 44
Front Wheel Rim (For 7.50 x 16-6 Ply Tires)	352 755 R91	352 757 R91	69
Front Wheel Weight, First	48 600 D	48 600 D	65
Front Wheel Weight, Second	48 602 D	48 602 D	65
Pneumatic Tire Pump (Enginair)	39 604 DA	39 604 DA	67
Pneumatic Tire Pump (Schrader)	39 622 D	39 622 D	67
Pneumatic Tire Pump Kit (Schrader)	350 342 R91	350 342 R91	67
Radiator Shutter	351 462 R91	351 462 R91	64
Rear Wheel Weight (First Set)	54 142 D	61 719 D	65
Rear Wheel Weight (Second Set)	54 143 D	49 330 D	65
Rear Wheel Weight (Third Set)	.....	49 331 D	65
Seed Plate Drive	350 024 R91	350 024 R91	64
Spark Arrester	55 348 D	55 348 D	66
Swinging Drawbar	69 426 D	351 685 R91	68
Touch-Control System	350 641 R91	350 641 R91	18
Wide Front Axle—Adjustable	.....	.....	50, 67
5000 Ft. Altitude Piston (Gasoline)	351 518 R91	351 518 R91	64
5000 Ft. Altitude Piston (Distillate)	351 591 R91	351 591 R91	64
5000 Ft. Altitude Piston (Kerosene)	351 592 R91	351 592 R91	64
8000 Ft. Altitude Piston (Gasoline)	351 519 R91	351 519 R91	64
8000 Ft. Altitude Piston (Distillate)	351 593 R91	351 593 R91	64
8000 Ft. Altitude Piston (Kerosene)	351 594 R91	351 594 R91	64

PTO seal CR 13685

Belt Pulley and Power Take-Off

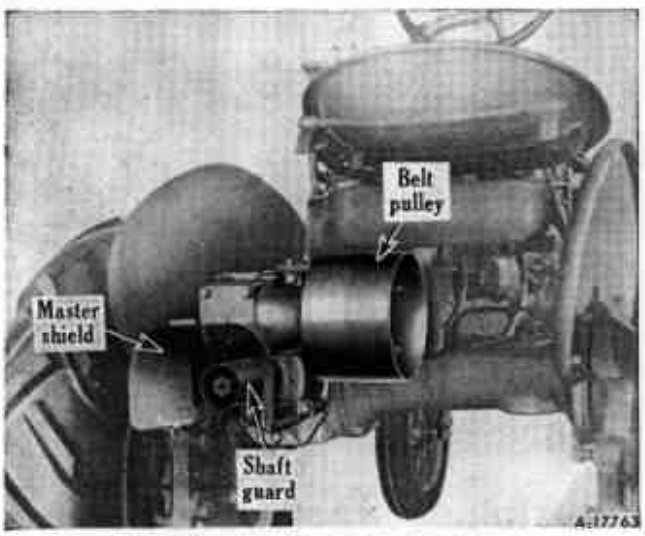
The power take-off extends the power of the engine to the rear of the tractor for operating power-driven implements. The power take-off shaft projects through the rear of the differential housing, and is driven by the transmission drive shaft. The power take-off shifter lever engages and disengages the power take-off shaft from the transmission drive shaft; the engine clutch should always be disengaged before moving this shifter lever. The power take-off has a speed of 541 r.p.m.

The belt pulley increases Farmall Super-A and Super-AV utility by making the power of the tractor engine available for the operation of belt-driven machines such as corn shellers, feed grinders and hammer mills.

The regular pulley has an 8½-inch diameter with a 6-inch face. Shaft speed is 1157 r.p.m., which gives a belt speed of 2574 feet per minute. There is another pulley available that has a 10½-inch diameter with a 6½-inch face. This pulley, with a shaft speed of 1157 r.p.m., gives a belt speed of 3179 feet per minute.

When the belt pulley attachment is not in use the pulley can be removed and the exposed shaft covered with spacer and pulley shaft guard.

When the power take-off shaft is not in use, it should be covered with the power take-off shaft guard.



Illust. 66—Belt Pulley, Master Shield, etc.

The Farm Equipment Institute Advisory Committee of Engineers, in cooperation with the American Society of Agricultural Engineers, developed standard specifications for the power take-off, master safety shield, and drawbar hitch point to assure a safe and properly operating hitch. These standard specifications are known as the A.S.A.E. Standard Power Take-Off.

This standard was submitted to and has been adopted by practically all farm tractor and implement manufacturers. With tractors and pull-behind power-driven machines built to these standards or converted to them, it is possible to use any make and kind of power-driven machine with any make and model of tractor.

The power take-off for your tractor conforms to standard dimensions and will operate any implement built to these standards. Implements that do not conform to these standards may be adapted to your tractor by means of conversion packages. To secure conversion packages consult your local dealer handling your make of equipment.

Note: Farmall Super-AV tractors have standard power take-off shafts, but do not conform fully to A.S.A.E. standards due to their construction as high clearance tractors.

General Dimensions

Diameter of power take-off shaft		1⅜ in.
Direction of rotation of power take-off shaft (looking from rear)		Clockwise
Type of spline connection		SAE-6B
Diameter of drawbar hitch hole		13/16 in.
Center of hole in power take-off shaft from end of shaft		1 in.
Center of groove in power take-off shaft from end of shaft		1½ in.
Center line of power take-off is on center line of Tractor on all models except Farmalls A and AV, on which it is 9 inches to left of center line of tractor.		
Power take-off governed speed		541 r.p.m.
†Drawbar extension plate (top—above ground at hitch hole—drawbar in next to lowest adjustment)	Farmall-A	15¼ in.
Top of regular drawbar above ground, at hitch hole (drawbar in next to lowest adjustment)	Farmall Super-AV	14½ in.
†Height of shaft above ground	Farmall-A	26 in.
	Farmall-AV	31⅝ in.
End of power take-off shaft ahead of drawbar hitch hole	Farmall-A	14 in.
	Farmall-AV	13 31/32 in.

* *When using Drawbar Extension Plate.*

†*Based on* 9-24 *Pneumatic Tires—Farmall-A.*
9-36 *Pneumatic Tires—Farmall-AV.*

Air Pipe Extension

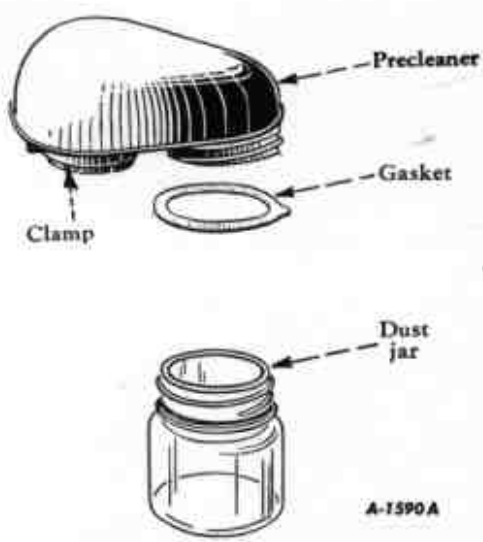
The air intake pipe regularly supplied is located high enough above the ground for most operating conditions. However, when heavy dust clouds continually envelope the breather pipe, it is best to add an air pipe extension. It gets the air screen above the dust, providing a fresher and cleaner supply of air for the engine which means longer tractor life and better performance.

Collector Precleaner

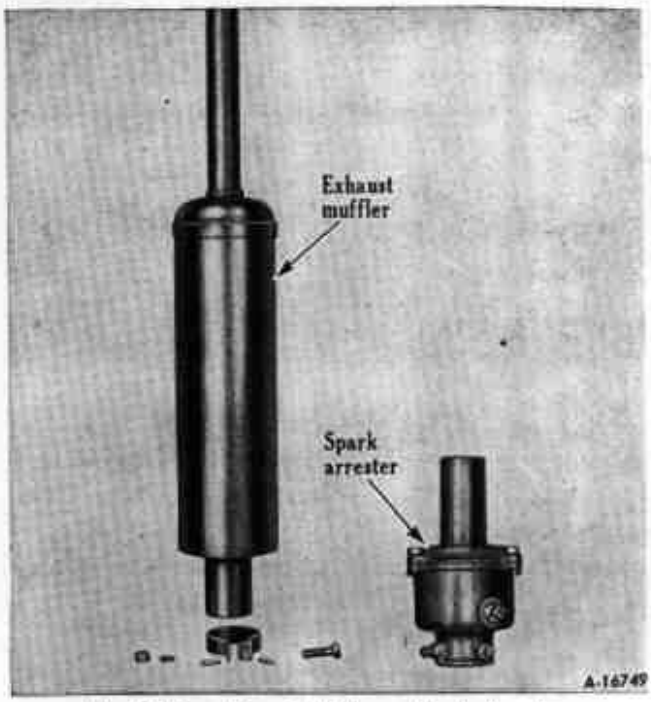
The collector precleaner is recommended as added protection when working under excessively dusty conditions.

To Clean

Remove and clean out the dust jar frequently, at least before the jar becomes ¾ full. Remove the precleaner and inspect the fins regularly. When the fins become dirty or oily, wash the entire precleaner in kerosene. Replace the gasket and tighten the jar securely.



Illust. 67—Collector Precleaner Disassembled for Cleaning.



Illust. 67A—Exhaust Muffler and Spark Arrester.

Exhaust Muffler

The exhaust muffler can be supplied for owners who desire quieter operation of their tractors. It reduces the sound of the exhaust to a quiet purr.

The muffler attaches easily to the exhaust pipe and may be attached to the spark arrester attachment in the same manner as it is attached to the exhaust pipe.

Spark Arrester

The spark arrester smothers and extinguishes any sparks that may be thrown off in the exhaust. It reduces the fire hazard when operating the tractor near inflammable material. The arrester attaches readily to the exhaust pipe. The muffler is attached to the spark arrester in the same manner it is attached to the exhaust pipe.

Cleaning

Once every month or after every 120 hours of operation remove the ½-inch pipe plug from the spark arrester body. Run the engine at low idle speed until all loose carbon particles have been blown out. Stop the engine and replace the pipe plug.

Radiator Shutter and Heat Indicator

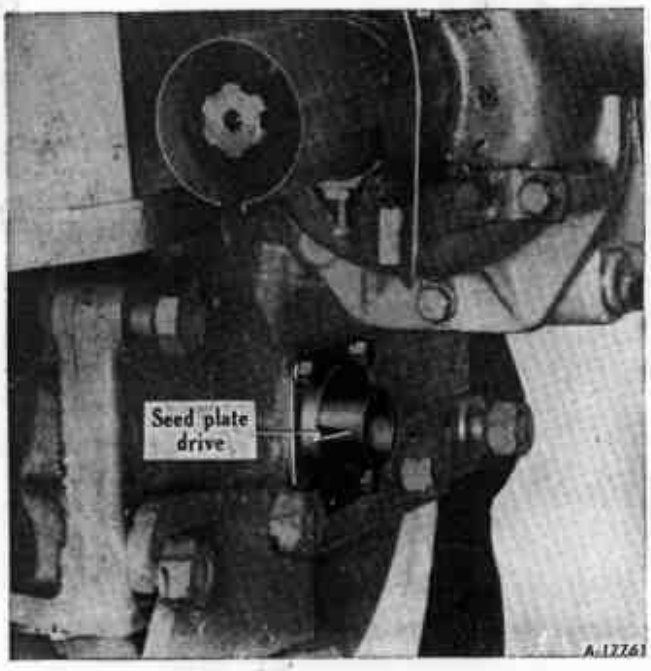
A radiator shutter is helpful for starting and operating in cold weather. In addition, a more even operating temperature can be maintained as the radiator shutter can be opened wide, closed tight (for starting), or set in any intermediate positions.

To Adjust the Radiator Shutter

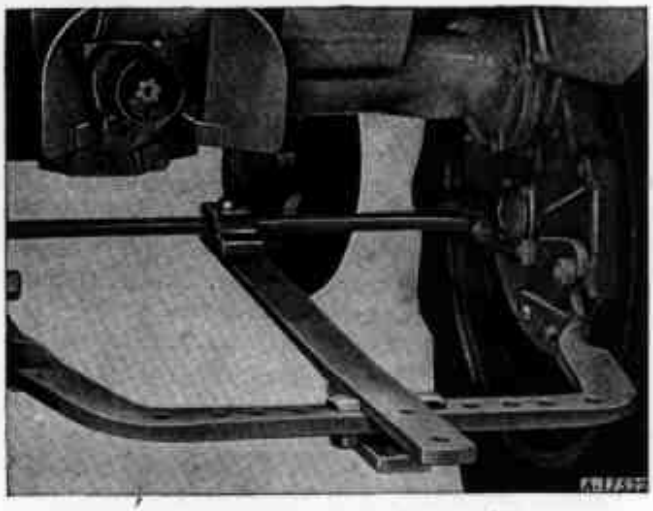
Close the shutter when starting the engine in cold weather and adjust it as required to hold the needle of the heat indicator in the high side of the "RUN" range when operating on distillate or kerosene or in the low side of the "RUN" range when operating on gasoline.

Seed Plate Drive

The seed plate drive, is attached to the inner side of the left rear axle, *Illust. 68*, and furnishes the power for seed planting attachments, also for the sowing of fertilizer. Refer to your implement book for complete instructions.



Illust. 68—Location of Seed Plate Drive.



Illust. 68A—Swinging Drawbar Assembled on Tractor.

Swinging Drawbar

The swinging drawbar is free to swing the full width of the regular drawbar, making it easier to turn the tractor under load when pulling trail-behind implements such as disc harrows. It also facilitates steering on the straightaway when the tractor is pulling a heavy load. The load exerts less sidewise pull on the tractor and therefore interferes less with the steering. This attachment is especially desirable when working in small, irregularly shaped fields.

High Altitude Pistons

High altitude pistons for use at elevations of 5,000 and 8,000 feet are available on special order.

5,000 Ft. Altitude Pistons

(Gasoline Operation)
(Distillate Operation)
(Kerosene Operation)

8,000 Ft. Altitude Pistons

(Gasoline Operation)
(Distillate Operation)
(Kerosene Operation)

Note: *These 5,000 and 8,000 ft. attachments consist of a complete set of cylinder sleeves and pistons.*

(For installation, see your International Harvester service dealer.)

Adjustable Front Axle

(For Farmall Super-A Only)

The adjustable front axle replaces the regular fixed front axle. The variable treads of 44, 48, 52, 56, 60, 62 and 64 inches permit adjustments to fit most any row crop ranging from narrow rows of vegetables to wide rows such as cotton and corn.

Refer to pages 48 and 49 for more information and instructions for adjusting the tread widths.

Adjustable Front Wheel

(For Farmall Super-A Equipped with Adjustable Front Axle)

When this attachment is used with the adjustable front axle, the following additional treads can be obtained: 40¾ inches, 68 inches, 70 inches and various other intermediate combinations. (The 40¾-inch tread position cannot be obtained on Farmall Super-A tractors equipped with 5.00 x 15-inch tires.)

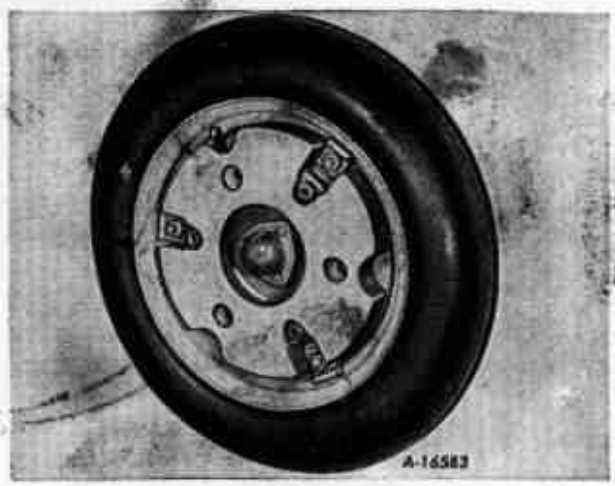
Front Wheel Rims (4.50 E x 16)

(For 7.50 x 16 Pneumatic Tires)

These rims are available for Farmall Super-AV tractors, and Farmall Super-A tractors equipped with an adjustable front axle and adjustable front wheels.

The above attachments consist of wider rims for mounting larger tires, thereby providing better flotation, particularly in light sandy soil.

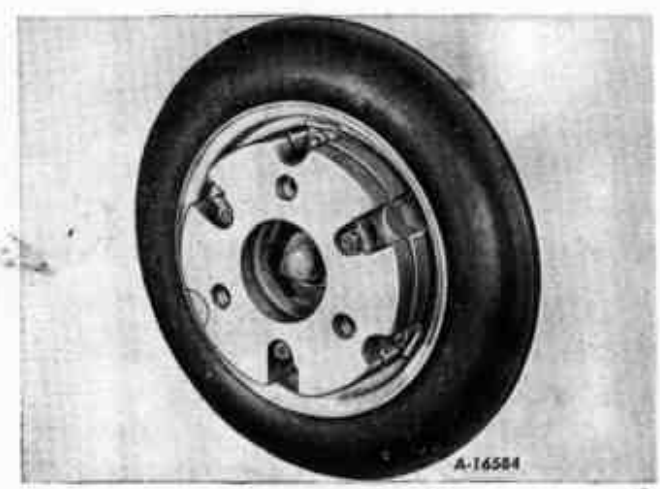
Illust. 69—Farmall Super-A Tractor with Adjustable Front Axle, Adjustable Front Wheels and 7.50 x 16 Pneumatic Tires.



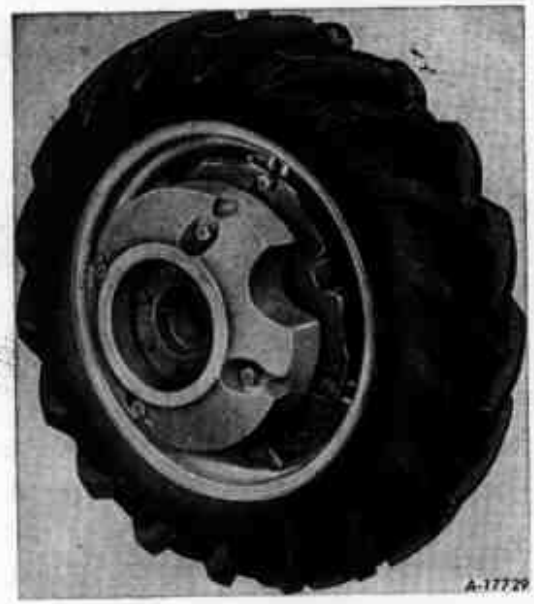
Illust. 69A—First Front Wheel Weight Assembled on Tractor.

Front Wheel Weights

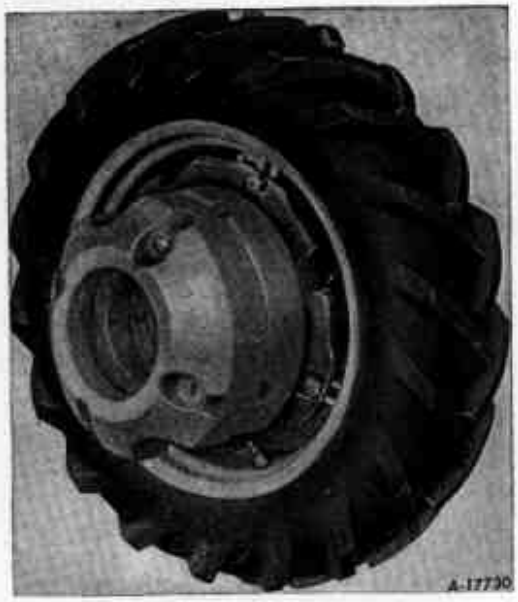
The front wheel weights weigh approximately 42½ pounds each, and either one or two can be attached to each front wheel. To increase steerability, front wheel weights are recommended for use as a front end counterbalance whenever heavy loads are superimposed on the drawbar, or when heavy equipment is to be mounted on the rear end of the tractor. The front wheel weight attachment includes a set of two weights and the necessary attaching bolts, nuts and lock washers. If additional weight is desired a second set of weights is available for attaching to the first weights.



Illust. 69B—First and Second Front Wheel Weights Assembled on Tractor.



Illust. 70—Rear Wheel with one Weight Assembled—for Super-A.



Illust. 70A—Rear Wheel with two Weights Assembled—for Super-A.

Rear Wheel Weights

Rear wheel weights are available for both the Farmall Super-A and Super-AV tractors.

These weights can be attached to each drive wheel to reduce slippage and increase drawbar pull. The increase in drawbar pull, with the proportionate reduction in slippage, varies with the type of soil.

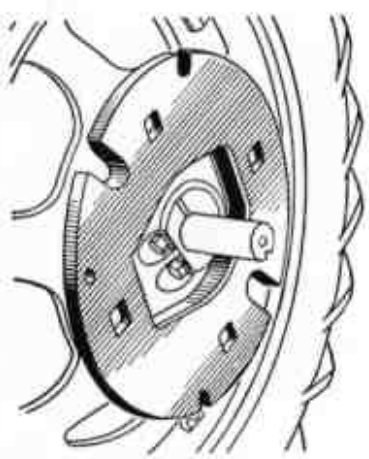
Farmall Super-A

The rear wheel weight attachment for the Farmall Super-A includes a set of two weights (weighing approximately 132 pounds each) with the necessary attaching bolts, nuts and lockwashers. If additional weight is desired, a second set of weights is available for attaching to the first weights, *Illusts. 70 and 70A.*

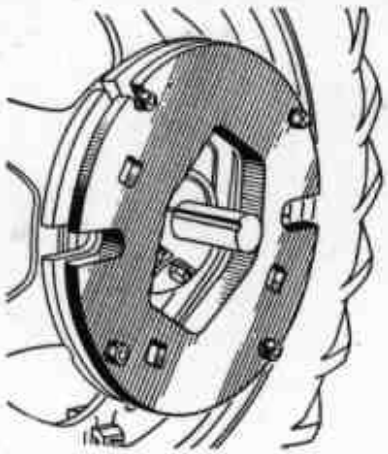
Before attaching the second rear wheel weights, it is necessary to remove two bolts from each first weight and replace them with the longer bolts provided with the second weights. When the second weights are removed, place the two shorter bolts in each weight.

Farmall Super-AV

The rear wheel weight attachment for the Farmall Super-AV includes a set of two weights (weighing approximately 145 pounds each) with the necessary attaching bolts, nuts and lockwashers. If additional weight is desired, a second and third set of weights is available for attaching to the first weights, *Illusts. 70B and 71.*



Illust. 70B—Rear Wheel with one Weight Assembled—for Super-AV.



Illust. 71—Rear Wheel with Two Weights Assembled—for Super-AV.

Rear Wheel Weights—Continued

Farmall Super-AV — Continued

The second set of weights are attached to the first set with another set of bolts, nuts and lockwashers furnished with the attachment.

Before attaching the third weights it will be necessary to remove two of the bolts which hold the second weights to the first weights and use them for attaching the third weights to the second weights. When the third weights are removed, replace the bolts in the first and second weights.

Pneumatic Tire Pumps

Enginair or Schrader

These tire pumps are useful where air service is not easily obtained. They may be used for inflating tractor, truck, or automobile tires.

Note: These tire pumps may be used with any carbureted type engine, but they cannot be used on Diesel engines. The tire pumps also are available for various spark plug thread sizes. Specify the size of spark plug thread when ordering.

If these pumps are to be used for inflating tires on a Diesel-powered tractor, a carbureted engine of another unit must be used as the source of power.

To Use—Remove one of the spark plugs from the tractor engine, or any carbureted engine having the correct spark plug thread size, and replace with the pumping element "A." Attach one end of the pump hose "B" to the pumping element and the other end "C" to the valve stem of the tire to be inflated. Start the engine and run it at low speed for maximum efficiency.

Schrader spark plug tire pump kit—This kit consists of items which are necessary for proper care of the tire valve and maintenance of proper air pressure. With this kit you can maintain tire pressure on all tractors, trucks and passenger cars by changing adapters on the tire pump to suit the spark plug thread size.

The following items are packed in a serviceable metal box:

One tire pump with 16 feet of hose and an air gauge for registering pressure up to 100 pounds.

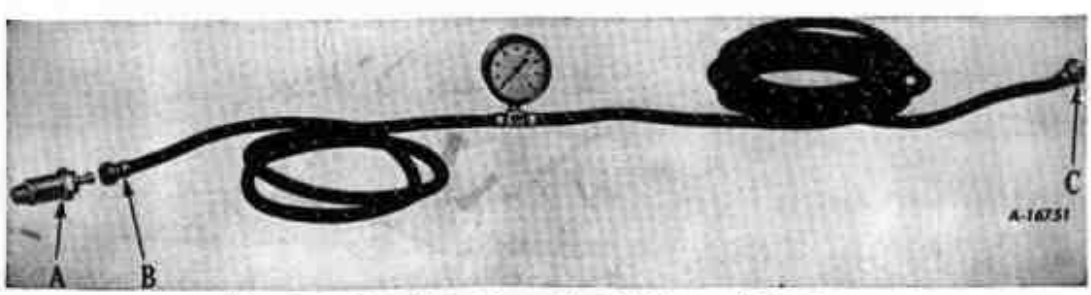
Five adapters for spark plug thread sizes 10 mm., 14 mm., 18 mm., $\frac{7}{8}$-18 and $\frac{1}{2}$ inch.

Five valve cores and five valve caps which fit all standard tire valves (packed in small metal boxes).

One valve repair tool and one valve fishing tool.

One air-water tire valve and one air-water adapter.

One tire pressure gauge for air-water tractor tires.



Illust. 71A—Enginair Tire Pump with 16-ft. Hose and Air Gauge.

SPECIFICATIONS

Capacities	Super-A	Super-AV
Cooling system	13 qt.	13 qt.
Fuel tank	11 gal.	11 gal.
Gasoline starting tank (with distillate or kerosene engine)	⅞ gal.	⅞ gal.
Crankcase pan	5 qt.	5 qt.
Transmission case (when not equipped with belt pulley and power take-off)	4½ qt.	5 qt.
Transmission case (when equipped with belt pulley and power take-off)	5½ qt.	6 qt.
Steering gear housing	1 qt.	1 qt.
Air cleaner oil cup (Donaldson or United)	¾ pt.	¾ pt.
Rear axle drive housing (each)	3 pt.	3 pt.
Engine		
Cylinders	4	4
Bore	3 in.	3 in.
Stroke	4 in.	4 in.
Engine speed (governed, maximum full load)	1400 r.p.m.	1400 r.p.m.
Magneto (fixed spark, clockwise rotation)	I.H., Type H-4	I.H., Type H-4
Spark plug (Champion 15-A or AC-85S Com.), gap	.023 to .027 in.	.023 to .027 in.
Valve clearance (engine hot)	.014 in.	.014 in.
Carburetor	Zenith or Marvel-Schebler, ⅞ in., updraft	Zenith or Marvel-Schebler, ⅞ in., updraft
Clutch		
Single plate, dry disc, spring loaded	9 in.	9 in.
Fuse and Headlight Bulbs		
Fuse (cartridge type) No. 106653	3AG–20 amperes	3AG-20 amperes
Headlight bulb I. H. No. 27369-D (Mazda 1133)	6-8 volt 32 candlepower	6-8 volt 32 candlepower
Belt Pulley and Power Take-Off		
Pulley speed	1157 r.p.m.	1157 r.p.m.
Belt speed (with 8½-in. pulley)	2574 ft. per min.	2574 ft. per. min.
Pulley diameter	8½ in.	8½ in.
Pulley face	6 in.	6 in.
Power take-off shaft speed (clockwise rotation)	541 r.p.m.	541 r.p.m.
Foot Brakes		
External contracting band type, drums on bull pinion and differential shafts, operated either individually or interlocked.		
Transmission (four speed)		
(Speeds based on pneumatic tire sizes)	9-24	9-36
Speed (miles per hour): 1st	2⅜	3
2nd	3⅝	4⅞
3rd	4⅞	6⅜
4th	10	11¼
Reverse	2⅞	2¾

SPECIFICATIONS

Wheels and Tread	Super-A	Super-AV
Front wheels, pneumatic tire size	† 4.00—15	† 4.00—19
Rear wheels, pneumatic tire size	† 9—24	† 9—36
Tread, front (nonadjustable axle)	43 in.	.....
Tread, front (adjustable axle—4 in. intervals)	44 to 64	44 to 68
Tread, rear (adjustable wheels and rim—4 in. intervals)	40 to 68	48 to 68
Wheelbase	71	71 5/8

† *Other pneumatic tire sizes available.*

General—Dimensions		
Length overall	106 1/8 in.	115 in.
Width overall: Minimum (to outside edge of rear tires)	55 7/8 in.	60 5/8 in.
Maximum (to outside edge of rear tires)	78 in.	77 3/4 in.
Height overall (to top of steering wheel)	64 1/4 in.	69 1/4 in.
Height to top of exhaust muffler	81 1/4 in.	88 1/2 in.
Ground clearance for crops under front axle	21 5/8 in.	27 in.
Ground clearance for crops under rear axle	21 5/8 in.	27 1/2 in.
Drawbar height above ground (adjustable)	11 1/4, 13 1/8, 14 7/8 and 16 7/8 in.	11 7/8, 14 1/8, 15 3/8 and 17 7/8 in.
Drawbar lateral swing to each side of center hole	9 3/8 in.	9 3/8 in.
Minimum turning radius (wheels in minimum tread)		
Without brake applied	9 1/2 ft.	9 1/4 ft.
With brake applied	8 1/2 ft.	8 3/4 ft.

INTERNATIONAL HARVESTER

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